

“Don’t give up on them”:
Managing Attention Deficit Hyperactivity Disorder in Schools - What
teachers and parents believe and know

Emmanuella K. Murray

Murdoch University

2009

This thesis is submitted as part requirement for the degree of

Doctor of Psychology, Murdoch University

Declaration

I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary education institution.

Emmanuella Keira Murray

2009

Conference Presentations

Portions of Chapters 4, 5 and 6 have been presented at:

Murray, E. K., (2009). An assessment and intervention program for pre-service teachers regarding knowledge of and attitudes toward children with attention deficit/hyperactivity disorder. Abstract presented at *The European Conference for Educational Research Pre-Conference* (September 25 2009), Vienna, Austria.

Abstract

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most prevalent childhood and adolescent behavioural disorders affecting children worldwide. This research investigated teachers' and parents' knowledge of, attitudes and behaviours toward children with ADHD. Findings from this investigation then informed the development and evaluation of a pilot ADHD intervention program for pre-service teachers designed to enhance their own knowledge and skills, and to frame intervention as a shared endeavour between parents, teachers and the broader school community.

Study One provided local confirmation of the broadly reported needs of teachers, pre-service teachers and parents for improved knowledge and change in attitudes toward children with ADHD. Both pre-service and in-service teachers held comparable views, though the former generally reported being less confident in their skills and abilities to manage these children. A small sample of parents of children with ADHD provided rich insight into their parenting experiences and the challenges faced in the school environment. Uniquely this study also included parents without a child with ADHD, in recognition of their importance in influencing the broader school environment for children with ADHD. Consistent with previous research, parents were somewhat informed about the characteristics of ADHD but less so about treatment. Descriptive comparisons between parents and teachers suggested that there were some similarities and some differences in what was known and what myths were held by the two groups.

Study Two is in two parts. Part one of the study further investigated pre-service teachers' knowledge of and attitudes toward children with ADHD. Seventy-seven pre-service teachers were surveyed whilst completing their third or final year of an Education degree at a university in Western Australia. There was a moderate correlation between a perceived competence factor on an Attitude Scale and scores on a Knowledge Scale. There was no greater knowledge amongst those reporting previous ADHD training at university, but there was a trend toward more unfavourable attitudes amongst respondents reporting no prior training. Descriptive analyses also showed a strong desire by pre-service teachers to engage in further ADHD training, irrespective of whether they had previous exposure to training or not.

This evidence base was then used in part two of Study Two to develop and evaluate a pilot intervention for pre-service teachers to improve knowledge, attitudes and self-confidence in teachers in responding to ADHD. Forty-five attended the intervention program. Of these, twenty-eight participants completed identical measures at pre, post and follow-up time points. Pre-service teachers showed a significant improvement in their knowledge scores and perceived knowledge and skills after the workshop.

Taken together, these studies suggest that while teachers have some knowledge about ADHD, there is a need for further training in order to better equip them for managing children with this condition in the classroom. Furthermore, parents with a child with ADHD desire further education about the disorder and those who do not have a child with ADHD are also likely to benefit also from education about the disorder and its corollaries in the school environment. Differences in understanding of ADHD between the groups emphasise the importance of developing a collaborative stance between teachers and parents in the school community. Finally, the pre-service pilot program was found to be an enabler for teachers to

understand and work more effectively with children with the disorder. Methodological limitations and directions for future research for each study are discussed.

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CHAPTER 1: OVERVIEW

The successful engagement of children with Attention Deficit/Hyperactivity Disorder (ADHD) in education settings is exceptionally difficult. Experts in the field often comment about the struggles children face in the classroom, both behaviourally and academically, and the effect these struggles have on life outcomes as well as on interpersonal relationships with educators, parents and peers (Barkley, 2006; DuPaul & Power, 2008; DuPaul & Stoner, 2003).

Given a majority of children with ADHD attend school in regular classroom settings, it is essential that teachers and parents are well prepared to provide consistent and appropriate care, management and education for them. Regrettably, the literature suggests that teachers are often inadequately prepared to carry out this role effectively. Of the very few studies investigating teachers' knowledge of and attitudes toward such children, even fewer document interventions designed to equip teachers with the necessary knowledge and skills toward better management of the condition. Of even more concern, there is no literature exploring parents' knowledge and capacity for doing so, nor is there literature investigating the challenges and potential in parents, teachers and the broader school community working together to provide a multimodal support base for children with the condition.

Thus, the purpose of this research is to examine teachers' and parents' knowledge of and attitudes toward children with ADHD and, in turn, to use this base of evidence to develop and evaluate a responsive ADHD intervention for pre-service teachers. This intervention will be designed so as to enhance their existing knowledge and skills, and to frame intervention as a shared effort between parents, teachers and the broader school community.

Before examining the literature on teacher and parent knowledge, attitudes or beliefs and behaviours, a brief introduction to key facts about ADHD will be provided. An understanding of classification, diagnosis, co-morbidity, aetiology, prognosis and assessment

mechanisms for ADHD can significantly impact on one's response to the disorder. Current research into ADHD and the school environment will then be reviewed. For the purpose of this research, children with ADHD will refer to both children and adolescents diagnosed with the condition. To make the scope of the project manageable and to maintain the focus on preventative training, adults with ADHD will not be examined as part of this research. Additionally, in order to provide consistency and clarity, I will refer to myself in the first person throughout this thesis.

1 Classification and Diagnostic Issues

1.1 Clinical presentation

An integral part of identifying a child with ADHD is being able to recognise their symptomatology. Accurate identification can lead to a greater chance of success for these children, particularly within the classroom environment.

ADHD is a diagnostic label used to describe children who present with developmentally atypical degrees of inattention, hyperactivity and impulsivity (APA, 2000; Barkley, 2006; Conners, 2000). This condition, if left undiagnosed and/or unmanaged, can result in significant long-term impairments across three primary settings: academic, social, and occupational functioning (APA, 2000; Barkley, 1998; Dupaul, Eckert, & McGoey, 1997; Rief, 2005). Typically, children with ADHD exhibit atypical persistent behaviours lasting at least six months, with an onset before seven years of age, although symptoms may emerge prematurely, for example, as early as age three (APA, 2000; Cohen et al., 1993). Many children are not diagnosed until commencing formal schooling due to the more prominent manifestation of ADHD symptoms in the school setting (Barkley, 2006). It is important to note that children may also exhibit several of the predefined symptoms of ADHD as part of normal maturation; thus a standardised framework for an accurate diagnosis of ADHD is

needed. Presently, the current diagnostic criteria for ADHD are defined in the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition-Text Revision (DSM-IV-TR) (APA, 2000). This system also recognises three empirically derived subtypes of ADHD: Inattentive Type in which children exhibit inattentiveness without signs of hyperactivity; Hyperactive-Impulsive Type in which children exhibit hyperactivity and impulsivity but without inattention; and the Combined Type in which children exhibit symptoms from each of the subtypes identified above (APA, 2000).

1.2 Diagnostic Problems

The present DSM-IV criteria are far from flawless; indeed, there are several inherent problems which may lead to erroneous diagnosis and subsequent treatment. Given the impact had by early identification on treatment of ADHD, medical professionals, parents and teachers need to be aware that these are unresolved problems in the diagnosis of the condition, in particular regarding issues surrounding categorisation into subtypes, and the accuracy and relevance of duration of the symptoms' criteria (Barkley, 1990; 2006; Barkley, Fischer, Edelbrock & Smallish, 1991; Goodyear & Hynd, 1992; Hart, Lahey, Loeber, Applegate, & Frick, 2005; Lahey, Carlson, & Frick, 1997; Nolan, Gadow & Sprafkin, 2001; Woo & Rey, 2005). There are two unresolved problems in the diagnosis of ADHD that ultimately challenge the merit of the DSM-IV criteria when diagnosing ADHD. Researchers such as Barkley (1990) have devoted a considerable amount of time to the constraints of the DSM-IV when diagnosing ADHD. Primarily, researchers have been preoccupied with two factors including, categorisation and symptomology. Comprehensive reviews of these issues can be found in Barkley (1990, 2006), Barkley et al. (1991) and DuPaul and Stoner (2003).

2 Prevalence

Prevalence rates indicate that ADHD is one of the most common childhood and adolescent behavioural disorders (American Psychiatric Association [APA], 2000; Barkley, 1998, 1990; Biederman, 2003; Carbone, 2001; DuPaul & Stoner, 2003; Fabiano & Pelham, 2003; Pastor & Reuben, 2002; Polanczyk, Lima, Horta, Biederman, & Rohde, 2007; Rief, 2005; Szatmari, 1992; Tannock & Schachar, 1996). The condition predominantly affects boys (Barkley, 1990; Carbone, 2001; DuPaul & Stoner, 2003; Fabiano & Pelham, 2003; Pastor & Reuben, 2002; Polanczyk et al., 2007; Rief, 2005; Sawyer, Arney, Baghurst, Clark, Graetz, Kosky, 2001) and frequently leads to significant social (Clark, Prior & Kinsella, 2002) and academic difficulties (DeShazo-Barry, Lyman, & Klinger, 2002). These, in turn, are often firstly identified by educators (Barkley, 1997; Saxe & Kautz, 2003; Vereb & DiPerna, 2004).

There have been numerous investigations into the prevalence of ADHD. Depending on the severity of the diagnostic criteria applied and measures employed, prevalence rates vary from 1% to 20 % among school-aged children (Cantwell, 1996; Cohen et al., 1993; Faraone, Sergeant, Gillberg, Biederman, 2003; Gaub & Carlson, 1997b; Polanczyk et al., 2007). According to Polanczyk et al. (2007) who conducted a systematic review and meta-regression analysis, the collective ADHD/Hyperkinetic Disorder (HD) prevalence worldwide is 5.29%. More specifically, in the United States of America (USA), ADHD is estimated to affect between 2 - 9% of school-aged children (Faraone et al., 2003; Froehlich, Lanphear, Epstein, Barbaresi, Katusic & Kahn, 2009; Rowland, Lesesne, & Abramowitz, 2002). In Australia, prevalence rates for children aged between 6 and 17 years is reported to be as high as 7.5% to 11.2% (Graetz, Sawyer, Hazell, Arney & Baghurt, 2001; Sawyer et al., 2001). These findings are comparable to numerous clinical and epidemiological studies conducted around the world, such as in the USA, South America and previous Australian studies.

In Australia concern is mounting over the apparent increase in the diagnosis of ADHD and prescription of stimulant medication for the treatment of the disorder, particularly in Western Australia. Recent data show W.A to hold the highest stimulant use of all Australian states, with treatment scaling as high as 2.4 %, and age-specific prevalence being as high as 3.5% (Preen, Calver, Sanfilipop, Bulsara, & Holman, 2007). These rates are also high when compared with international reports, such as those from the USA, which document prevalence rates of 1.0% to 2.3% (Preen et al., 2007). Opinions about why there are such differences in prevalence rates are divided (Biederman et al., 1995; Preen et al., 2007; Prosser & Reid, 1999). It is clear that further research is needed before any conclusion can be drawn.

3 Co-morbidity

Numerous epidemiological studies report that ADHD often occurs concurrently with other clinical disorders (Biederman, Newcorn, & Sprich, 1991; Jensen et al., 1997). Co-occurring disorders in children with ADHD can impact on diagnosis, prognosis and the subsequent development of treatment plans for children with ADHD (Jensen, Martin & Cantwell, 1997; Pliska, 1992). That is, often children differ both in their co-morbidity patterns and responsiveness to specific treatments which, in some cases, can result in unique outcomes (Mayes, Calhoun, Chase, Mink, & Stagg, 2009). Despite this, there is little empirically supported research investigating the impact of co-morbidity on diagnosis, treatment and outcome for children with ADHD (Mayes et al., 2009; Reif, 2005; Tannock, 1998). Several studies have found the presence of Conduct Disorder (CD) and Oppositional Defiant Disorder (ODD) to have the strongest co-morbid correlation with ADHD in children (August, Realmuto, MacDonald, Nugent & Crosby, 1996; Barkley 1990; Biederman, Munir, & Knee, 1987; Biederman et al., 1991; Hinshaw, Lahey & Hart, 1993; Schachar & Tannock, 1995; Werry, Elkind & Reeves, 1987). Research, particularly in the USA, indicates that

approximately 30-50 % of individuals with ADHD have a co-morbid CD or ODD condition (August et al., 1996; Biederman et al., 1991).

Of even more consequence, approximately 35-54% of children with ADHD suffer from a concomitant, often language-based, learning, speech or reading disability (Barkley, 1998, 1990; Berry, Shaywitz & Shaywitz 1985; Cantwell & Baker 1991, 1992; Frick et al., 1991; Goldstein, 1997; Hook & DuPaul, 1999; Kim & Kaiser, 2000; Mayes, Calhoun & Crowell, 2000). By contrast, internalising disorders, such as anxiety and depressive disorders, have been found to have a much lower coexistence with ADHD, generally ranging from 13-52%, depending on the method and sample employed (August et al., 1996; Biederman et al., 1993; Hornig 1998; Jensen et al., 1997; Pelham & Fabiano, 2001).

The gender differences in the manifestation of co-morbid disorders in children with ADHD are significant. Biederman et al. (1999; 2002) found that girls were predisposed to having an ADHD inattentive diagnosis, and were less likely to exhibit symptoms related to depression, ODD, and CD. Girls were also less likely to indicate difficulties at school and/or have a learning disability compared to boys who were more likely to have a co-morbid learning disability, ODD or CD (Biederman et al., 2002).

4 Aetiology

Despite the high prevalence, chronicity, and impairment created by ADHD in children, there is still scepticism about the validity of the disorder. A common misconception about the condition is that it has no pathological origin but is a result of poor parenting or spoiling during development. As a result of such misconceptions, investigations have shown that children with ADHD and their parents have been treated with a lack of sympathy and understanding. Although there is no conclusive empirical evidence supporting the definitive cause of ADHD, there is considerable evidence suggesting a neural pathophysiological

impairment (Aylward et al., 1996; Barkley, 1995; Castellanos et al., 1996, 2002; Fischer, Barkley, Fletcher, & Smallish, 1990; Hynd, et al., 1991; Kelly, Margulies, & Castellanos, 2007; Mercugliano, 1995; Tannock, 1998) arising from a combination of genetic (Biederman, Faraone, Keenan, Knee & Tsuang, 1990; Cantwell, 1975; Faraone, Biederman, & Friedman, 2000; Kuntsi & Stevenson, 2000; Sprich, Biederman, Crawford, Mundy, & Faraone, 2000; Swanson, Castellanos, Murias, LaHoste, & Kennedy, 1998) and environmental factors (Faraone, Biederman, Keenan, Tsuang, 1991; Gee, Williams, Anderson et al., 1995; Milberger, Biederman, Faraone, Chen & Jones, 1996; Schwarz, 1994; Wolraich, Wilson & White, 1995).

5 Prognosis

ADHD is a chronic childhood condition. Sadly, there is no cure for ADHD, and in many cases, symptoms persist into later life (Barkley, 1998). As defined earlier, children with ADHD clinically present with symptoms of inattention, impulsivity, and hyperactivity (APA, 2000). These difficulties cumulatively impact on their academic ability and social integration which commonly results in a lowered self-esteem (Barkley, 1998; DuPaul & Stoner, 2003; Mannuzza & Klein, 2000). In 30-70% of all children with ADHD, symptoms continue into adolescence (Barkley, 1998). ADHD has been found to have a significant impact on life outcomes including academic performance, interpersonal relationships, employment and self-image (Barkley, 2006; DuPaul & Stoner, 2003).

6 Treatment of ADHD

According to Barkley (1997; 2006), the preferred approach to management of ADHD involves multimodal intervention and collaboration between professionals, teachers, and parents in identifying, assessing and monitoring children. Early detection is imperative for

successful outcomes (Barkley, 1997; 2006) and is largely reliant on detection by teachers and parents (DuPaul & Stoner, 2003). However, to ensure that symptoms of ADHD are identified as soon as they are manifest, teachers and parents must have a sound knowledge and a general increased awareness of ADHD. The present study aims to assess whether teachers and parents are adequately informed about ADHD and, what the implications are for further education and training.

Parents of child(ren) with ADHD are a crucial part of the multimodal treatment approach (Barkley, 1990). It is vital that parents, teachers and medical professionals work together consistently. Consequently, it is crucial that these parents have a factual understanding of the nature of the disorder, and that they are equipped with functional and flexible strategies to assist them in the management of their child(ren) at home (Barkley, 1995). Unfortunately, there is a paucity of data detailing parents' knowledge of ADHD at present. Notably, it is not only parents of children with ADHD who impact on the progress of these children in school; the attitudes of other parents in the broader school community can have a significant impact on how the child is accepted and responded to by peers and by other parents.

Despite the relatively high prevalence and considerable challenges associated with ADHD, and the obviously important role both teachers and parents play in the management of the condition, few studies have examined whether present strategies employed by teachers and parents are having a beneficial effect on children with ADHD. While recent research in Australia (Bekle, 2004; Kos, Richdale, & Jackson, 2004; West, Taylor, Houghton, & Hudyma, 2005) and the USA (Arcia, Frank, Sanchez-LaCay, & Fernandez, 2000) has focused on the needs of children with ADHD in the classroom, more research contributing to identifying gaps in knowledge and skills of teachers and parents is needed.

7 ADHD and the School Environment

A primary front for early detection and effective management of ADHD is the school setting; and the vital role of teachers is not disputed. For children with ADHD to function successfully within the classroom setting, effective development and implementation of appropriate interventions is necessary. An improved awareness and understanding of ADHD by teachers allows for better performance of children with ADHD in the classroom (Barkley, 1998). For them, an inclusive, rather than exclusive participation in school activities allows such children to build their self-esteem and resilience, which in turn can only contribute to their future successes (Barkley, 1998; Rief, 2005). However, with so many students in the classroom, the challenging behaviours exhibited by children with ADHD can pose substantial difficulties for teachers in providing the support required.

7.1. Core Challenges for Students with ADHD in Education Settings

The structured classroom can pose a tremendous challenge for children with ADHD because of its preoccupation with students exhibiting goal-directed behaviour and self-regulation (Barkley, 1990; Dupaul & Stoner, 2003; Rief, 2005; Schwean, Parkinson, Francis, & Lee, 1993). Success in this environment is often dependent on the child's ability to attend to tasks, comply with instructions, and conform to classroom expectations with minimal distraction (DuPaul & Stoner, 2003). Consequently, the core symptoms of the disorder, specifically: inattention, impulsivity and hyperactivity, can provide an inexorable barrier. Accordingly, children with ADHD are at risk of academic underachievement (Dupaul & Stoner, 2003; Pfiffner & Barkley, 1990) as well as diagnosis of a learning disability, lowered self-esteem, social rejection (Bagwell, Molina, Pelham & Hoza, 2001; Hodgens, Cole & Boldizar, 2000; Woodward & Ferguson, 1999) and anti-social behaviour (Barkley, 1990; Barkley et al., 1990; Dupaul & Stoner, 2003; Gittleman, Mannuzza, Shenker, & Bonagura, 1985).

Characteristically, children with ADHD have trouble maintaining or sustaining attention to tasks with which they are presented (APA, 2000). These difficulties compromise their ability to concentrate for long periods of time, which often restricts them from completing set tasks. Furthermore, their lack of organisation may also impact on their academic performance, particularly if they are constantly losing or misplacing materials pertinent to completing their school work. The continuation of these behaviours often impacts on the child's school environment, academic performance, and their ability to form peer relationships (Mather & Goldstein, 2001). Barkley (1990) asserts that approximately 95% of students with ADHD underachieve academically, this being prevalent throughout their entire schooling years (Dupaul & Stoner, 2003; Fischer, Barkley, Fletcher, & Smallfish, 1993). The primary impulsive and hyperactive symptoms have been found to be disturbing for the teacher and other students in the class. For example, a hyperactive-impulsive child may find it difficult to stay seated, stay on task and/or repeatedly fidget with objects not necessary for the instructed task. This results in the child misunderstanding the material presented, displaying an array of disciplinary problems and disrupting peers (Barkley, 1998; DuPaul & Stoner, 2003; Pfiffner & Barkley, 1990). Peer perception of their disruptive behaviour is compounded by difficulties in responding appropriately to social cues (Atkinson, Robinson & Shute, 1997). Although it is suggested that these primary symptoms diminish as children reach adolescence, often secondary problems, including such antisocial behaviours as stealing, fighting, lying or vandalism surface, leading to, in some cases, a greater school dropout rate, and emotional adjustment problems (DuPaul & Stoner, 2003).

Since the classroom is an important context for these students, effective intervention in the classroom setting is essential for the academic progress and emotional well-being of children diagnosed with ADHD. Teacher knowledge is integral to the development of such interventions. Perhaps even more important are the attitudes teachers have towards teaching

children with ADHD. The absence of such knowledge may lead teachers, and even parents, to hold faulty attributions and wrongly label children with ADHD as “naughty”, or even “lazy”. Due to the challenging behaviours exhibited by these children, it is understandable that teachers may feel overwhelmed.

7.2 Teachers’ Knowledge of ADHD

The success of children with ADHD in the classroom largely resides in the hands of their teachers. Teachers must have a thorough understanding about the nature and function of these children’s behaviours, and how they are influenced by the management strategies employed in the schooling environment. Furthermore, teachers need to possess a working knowledge of how to introduce and apply these interventions effectively in the classroom in such a way that will support the personal, social and emotional needs of each child (Barkley, 1998).

Traditionally, clinical research has focused primarily on the study of the various aetiologies, assessment practices, and treatment options of the disorder. Given the vital role teachers play in the success of ADHD children in the classroom, investigations into implications of the disorder in educational settings are scarce (Barkley, Dupaul, & McMurray, 1990). School-based research has generally focused on the externalising behaviours children with ADHD experience within the classroom (Abikoff et al., 2002; Barkley, 1998; Barkley et al., 1990; DuPaul et al., 1997; DuPaul & Stoner, 2003; Pfiffner & Barkley, 1990). However, little is known about the level of ADHD knowledge and the attitudes and/or beliefs of teachers who spend a considerable amount of time with these children.

There are ten published studies which have examined teachers’ awareness and knowledge of ADHD - four from Australia (Bekle, 2004; Kos et al., 2004; Ohan, Cormier, Hepp, Visser & Strain, 2008; West, Taylor, Houghton, & Hudyma, 2005); one from New

Zealand (Curtis, Pisecco, Hamilton & Moore, 2006); five from North America (Barbarese & Olsen, 1998; Jerome, Gordon, & Hustler, 1994; Jerome, Washington, Laine, & Segal, 1999; Sciotto, Terjesen, & Bender-Frank, 2000; Vereb & DiPerna, 2004).

Findings suggest there are many misconceptions surrounding educators' knowledge of the disorder. Jerome et al. (1994) assessed teachers' general ADHD knowledge in a sample of both American and Canadian elementary teachers, employing their own 19 item true/false scale. The results of this study showed that while teachers did demonstrate a good overall awareness of ADHD (Canadian, 78% accuracy; American, 77% accuracy) their knowledge on available treatments remained poor. Barbarese and Olsen (1998) also mirrored these findings, with an overall correct response rate of 77%. Further details of this study are discussed in Chapter Four.

More recent research by Sciotto et al. (2000) found similar results. These researchers used their own Knowledge of Attention Deficit Disorders Scale (KADDS) with a 36 item true/false/don't know response format for greater discrimination of responses to avoid guessing responses. It was given to 149 New York elementary school teachers, finding that teachers scored 48% correct on their knowledge questionnaire a lower base rate as a result of the different response options. However, their study supported the findings of Jerome et al. (1994), in that teachers showed greater knowledge about the symptoms/diagnosis of ADHD (63% correct) than general information about ADHD (43% correct) and its treatment (43% correct).

Teachers' deficient level of ADHD treatment knowledge was also found in a more recent study by Vereb and DiPerna (2004) who administered the Knowledge of ADHD Rating Evaluation (KARE) to 47 elementary teachers from the Eastern states of the USA, Pennsylvania and New Jersey. The results of the study demonstrated that teachers can have a sound knowledge of ADHD (70%), without necessarily being aware of available treatments

(54%). Similarly, the Curtis et al. (2006) study, which administered the Jerome et al. (1994) questionnaire to 261 New Zealand regular and special education elementary teachers, found they held reasonable levels of overall ADHD knowledge (76%), echoing Jerome et al.'s (1994) results with their North American elementary teachers.

In Australia Kos et al. (2004), using a scale modelled from the scales used by Scitutto et al. (2000) and Jerome et al. (1994) found an overall correct knowledge score of 60.7% in their sample of 120 Australian primary school teachers. Consistent with these findings, a study by Bekle (2004) found Australian teachers ($n = 30$) in Perth to have an overall correct knowledge rate of 83%. Similarly, the West et al. (2005) study deployed a modified version of the KADDS to assess primary and secondary school teachers in Perth, Australia; they found an overall correct knowledge score of 53.9% for all teachers. In light of these Australian studies it could appear that Australian teachers possess a better ADHD knowledge base when comparing scores on the respective knowledge scales than their North American counterparts but, like most research studies, these investigations were not without their limitations and differences that make comparability difficult. It is not known whether the representation of these samples may have influenced their results, or whether methodological differences such as sample size and scale differences, including the differences in content covered, response options, the number of items used, and the individual content of each item (i.e., some items provided more detail than others), may have played a role (Kos, Richdale & Hay, 2006; Ohan, Cormier, Hepp, Visser, & Strain, 2008).

In a more recent investigation into teacher ADHD knowledge, Ohan et al. (2008) using the Jerome et al. (1994) scale, assessed 140 primary teachers (mean age of 42.33) from Melbourne, Australia. They found teachers scored correctly on 76.34% of the ADHD knowledge items, but lower on their knowledge of causes and treatments. Congruent with previous studies (Jerome et al., 1994; Vereb & DiPerna, 2004), teachers also held some

important misconceptions about the causes and treatment of ADHD. These findings compare favourably with those studies already mentioned pertaining to North America and New Zealand (Curtis et al., 2006; Jerome et al., 1994; Sciutto et al., 2000).

In sum, the literature reviewed above indicates that, universally, teachers are more knowledgeable about ADHD symptoms and diagnosis but fare less positively when their level of general information and ADHD treatment knowledge is considered. When given an option of indicating a 'Don't Know' response, their base rate of knowledge is lower due to a likely reduction in guessing.

Differential results have been reported regarding whether or not years of teaching experience is seen as having an impact on teachers' knowledge of ADHD. Jerome et al. (1994) surveyed 439 American and 850 Canadian primary school teachers, finding that the number of years teaching experience significantly correlated with higher ADHD knowledge scores for Canadian teachers, but was not significant for teachers from America. Consistent with the Canadian findings, both Bekle in an Australian (2004) study and Sciutto et al. (2000) in a North American study also showed that years of teaching experience were significantly related to overall ADHD knowledge. However, in other Australian research, Kos (2004) failed to find support for these findings. Perhaps an associated factor to teaching experience is teachers' prior exposure to children with ADHD in the classroom. Sciutto et al. (2000) found prior exposure to teaching children with ADHD (i.e., number of students taught) was positively related to scores on the ADHD knowledge questionnaire. By contrast, these findings were not evident in the Kos et al. (2004) study.

Importantly, the West et al. (2005) study also found that professional development influenced teachers' ADHD knowledge. Those teachers who had attended training in the previous 12 months scored higher on The Knowledge about Attention Deficit Disorder Questionnaire (KADD-Q) ($M = 40.52$) than those who had not ($M = 34.43$). Comparably,

those teachers with special education qualifications had higher scores ($M = 39.04$) than those who did not ($M = 35.08$). These findings are consistent with the Kos et al. (2004) and Jerome et al. (1994) findings, which reported that teachers who had specific ADHD training were more knowledgeable about ADHD than their less educated counterparts.

The common misconceptions in teacher knowledge about ADHD are particularly salient when the continual training of teachers is considered. Researchers have concluded that there is need for teachers to be educated or re-educated on factual knowledge related to the disorder (Bekle, 2004; Jerome et al., 1994; Kos et al., 2004; West et al., 2005). Given the great potential to do harm through misunderstanding, a preventative strategy is preferable. Providing ADHD training to pre-service teachers would mean that they are equipped from the outset to notice and respond to the needs of children with ADHD in their classroom. The current study will add to the existing literature by exploring and comparing the knowledge and attitudes of both pre-service and in-service teachers to ADHD. In the past, a research deficiency has also been the use of tools that assess only a limited number of constructs such as attitudes towards cause and/or treatment, or the confusion of attitudes with myths (Kos et al., 2006). This study will use a measure specifically designed by Kos (2004) to assess attitudes of teachers. Further, in the current study, it will be used to provide an evidence base for the development and evaluation of a relevant training opportunity for these trainees. To date, there appears to be no published training program on matters related to ADHD for pre-service teachers.

7.3 Attitudes of Teachers Towards Children with ADHD

Empirical evidence indicates a relationship between knowledge, attitudes and behaviour (Barkley, et al, 1998; 2006; Kos, 2004). Despite this, studies assessing the impact of teachers' knowledge of and misperceptions on attitudes and behaviour toward children with ADHD are scarce. Bekle's (2004) Australian study measured in-service ($n = 30$) and

pre-service teachers' ($n = 40$) knowledge using a modified version of the Jerome et al. (1994) scale, including, uniquely, a separate measure of attitudes towards ADHD. While it is difficult to ascertain the exact details of the attitude measure, it appears teachers were required to respond to a question stating, "What is your attitude towards ADHD in children?" using a seven point Likert-type scale ("favourable" to "unfavourable"). The study found participants who were better informed about ADHD held more positive attitudes towards students with ADHD. Similar results have been found in another cultural context. Research in Iran using a questionnaire prepared by the authors has exposed a positive link between elementary teachers' ($n = 196$) knowledge and attitudes, indicating those teachers who knew more about ADHD also had a more tolerant attitude (Ghanizadeh, Bahredar, & Moeini, 2006).

According to Kos et al. (2004; 2006), other research assessing teachers' attitudes (Barabaresi & Olsen, 1998; Jerome et al., 1994) has lacked any assessment of attitudes toward ADHD, with many making no distinction between the knowledge and attitude items, or with items purporting to assess attitudes being inadequate (Kos et al., 2006).

7.4 Teachers' Perceptions and Behaviours Toward Children with ADHD

Management of children with ADHD in the classroom is perhaps the most important ingredient for their success in the educational setting. However, little, if any, attention to research has focused on what is known about specific management practices and the impact of teachers' perceptions of ADHD on their application of such practices. Researchers have investigated the link between teachers' knowledge and attitudes, finding that both can have a significant influence on teaching practices, which consequently can affect the performance of students with ADHD in the classroom (Arcia et al., 2000; Barkley, 1990; Bekle, 2004; Fiore, Becker, & Nero, 1993; Goldstein & Goldstein, 1998; Isenberg, 1990; Kos et al., 2004; Reif, 2005; Richardson, Anders, Tidwell & Lloyd, 1991; Ohan, Cormier, Hepp, Visser & Strain, 2008; West et al., 2005).

There are however conflicting research findings in this area. Scitutto et al. (2004) found no link between ADHD knowledge and teachers' reported behaviours and perceptions. Elementary teachers from north-eastern Ohio were asked to complete the KADDS and the Child Background Profile and Questionnaire including a series of profiles of fictional report cards describing concerns about inattentive, hyperactive, or hyperactive plus aggressive behaviours. Results suggest that teachers' knowledge of ADHD is not reflected by a greater rate of referral to health professionals, and nor does it influence the teachers' perception of the level of disruption in the classroom arising due to the behaviour of children with ADHD.

In contrast to Scitutto et al. (2004), Ohan et al. (2008) examined teachers' ADHD knowledge on their reported behaviours toward and perceptions of children with ADHD; their findings were contrary to those to Scitutto et al. (2004). To illustrate: teachers were asked to read a series of vignettes about children with ADHD and rate their reactions to these children. They found that teachers with high and average scores on the ADHD knowledge scale were significantly more likely to engage in help-seeking behaviours, such as being more supportive of behavioural treatments in the classroom, and finding or encouraging parents to seek professional assessment services (Ohan et al., 2008). Unlike Scitutto et al. (2004), teachers' knowledge of ADHD did improve teachers' help seeking behaviour which should benefit children with ADHD as well as improve the general classroom environment. However, indications were that teachers' greater awareness and knowledge of ADHD may not always be associated with positive outcomes, with teachers reporting less confidence in their abilities to teach and manage children with ADHD in the classroom. Perhaps it is beneficial for teachers to have realistic expectations about what is likely to happen in the classroom so that they can be better prepared to decide how to respond, if necessary.

Other studies aimed at investigating teachers' application and effectiveness of management strategies for ADHD in the classroom are scarce. However, Kos et al. (2004) in

their investigation of the strategies used by Victorian primary school teachers in the classroom to manage students with ADHD found that of the five classroom management strategies investigated, “reinforcement” was the most frequently used and “planned ignoring” was least frequently used. A meta-analysis conducted earlier by DuPaul and Eckert (1997) found that behavioural interventions, particularly the application of reinforcement and negative consequences, were quite effective in improving classroom behaviour.

Since then, a study by Curtis et al. (2006) also examined American (n =159) and New Zealand (n =261) teachers’ perceptions of classroom management interventions for ADHD. Teachers completed The Background Information Questionnaire, an ADHD Knowledge Scale (Jerome et al., 1994), Behavioural Intervention Rating Scale (BIRS) in addition to reading one of the six vignettes describing the behaviour of a fictional student with ADHD-like behaviours. After reading the vignettes, teachers then examined a description of four interventions: daily report card (DRC); response cost technique (RCT); stimulant medication such as methylphenidate, and classroom lottery (CL). Teachers were then required to rate their level of agreement or disagreement with each intervention using the BIRS. They found that teachers indicated the DRC intervention to be the most acceptable, effective and quickest method for producing changes among students with ADHD (Curtis et al., 2006).

Furthermore, gender was also found to influence a teacher’s perception of the acceptability of treatment. For example, teachers were found to be more opposed to stimulant medication for girls than for boys. As indicated by Sherman, Rasmussen, and Baydala (2008) these findings may have significant implications for the management of students with ADHD in the classroom. If teachers were more inclined to apply behaviourally based treatment methods for their female students than for boys this could lessen referrals of female students to health professionals (Sherman et al, 2008). In this event, teachers’ perceptions of treatment acceptability in boys’ and girls’ could well impact on the type of treatment/management of

children with ADHD in the classroom. The conclusion supports earlier findings by Scitutto et al. (2004) who found teachers to be more inclined to refer boys than girls to health professionals. Furthermore, the importance of surveying both knowledge and attitudes amongst teachers to best predict likely practice in the classroom is also highlighted here.

In order for teachers to play an effective role in the systematic approach to the diagnosis, treatment and management of children with ADHD in the classroom, it is essential that they be well informed about ADHD; have an objective attitude towards the nature of the disorder; and be familiar with and well equipped to implement proven effective classroom management interventions in order to optimise children with ADHD for success in the classroom (Goldstein & Goldstein, 1998). This assertion is potentially just as important for the children's parents and perhaps also has some relevance for parents in the broader school community.

8 Parents' Experience and ADHD Knowledge

Parents are an integral ingredient to the success of the multimodal approach to assessment and the treatment of ADHD. In turn, their beliefs and attributions can also play an important part in shaping the treatment process. For these reasons, further investigation into parents' ADHD knowledge and attitudes towards ADHD is warranted.

A parent's role is unequivocally multilayered. Parents and caregivers play a vital role in the development and growth of their children. The role of a parent can include, and is not limited to, love, protection and guidance in shaping their child's future. As parents of children with ADHD, they are also expected to act as case managers: supervising, monitoring, teaching, and managing the needs of their individual children (Barkley, 1998). Given the behaviours children with ADHD exhibit, it is understandable that many parents succumb to stress or burnout. Elevated stress levels are associated with disruptions to the

parent-child relationship and parent psychological functioning (Anastopoulos, Guevremont, Shelton, & DuPaul, 1992; Harrison & Sofronoff, 2002; Mash & Johnston, 1990). Often this is compounded by frustrations associated with trying to make certain that the needs of their child are being adequately addressed at school.

ADHD research has primarily focused on a parent's knowledge and attitudes toward treatment, more specifically pharmacotherapical approaches (Arcia, Fernandez & Jaquez, 2004; Berger, Dor, Nevo, & Goldzweig, 2008; Corcoran & Dattalo, 2009; dosReis & Myers, 2008; Ghanizadeh, 2007; Harpur, Thompson, Daley, Abikoff, Sonuga-Barke, 2008; Johnston, Seipp, Hommersen, Hoza, & Fine, 2005; Stroh, Frankenberger, Cornell-Swanson, Wood, Pahl, 2008). Additionally, studies have also shown that a parent's higher ADHD knowledge can lead to improved attitudes toward treatment acceptance and compliance (Bennett, Power, Rostain, & Carr, 1999; Corkum, Rimer, & Schachar, 1999). While some researchers suggest these findings still to be inconclusive (Bussing, Gary, Mills, & Garven, 2007), there is no denying that parents' potential to influence treatment decisions is an important consideration in the overall management of children with ADHD.

West et al. (2005) is the only study to date primarily focusing on the knowledge and attitudes of parents ($n = 92$) toward children with ADHD and, as indicated previously, the authors compared these findings to teachers' knowledge and attitudes. Parents' scores revealed that they were able to correctly answer 62.1% of the items on the knowledge scale. Parents' percentage of correct scores on the causes, characteristics and treatment subscales were, 76.7%, 62.8%, and 57.8%, respectively. Furthermore, parents who attended an information seminar about ADHD in the previous 12 months scored higher ($M = 50.68$) than those who had not ($M = 38.05$). Similarly, parents who belonged to a support group ($M = 48.33$) scored higher than those who did not ($M = 39.61$). Parents scored higher on their knowledge of causes than on the characteristics of ADHD. Interestingly, some recent

preliminary evidence also supports a cultural variation in parental ADHD knowledge among Caucasian and African American parents, the latter reporting less awareness and lower self-rated ADHD knowledge (Bussing, Gary, Mills, & Garven, 2007). This finding perhaps highlights a need for more culturally accessible and appropriate training approaches when working with parents from culturally diverse backgrounds.

The foregoing West et al. research highlights that there are significant misconceptions about ADHD found among educational professionals. In order to investigate teachers' and parents' knowledge and attitudes towards children with ADHD, a 67 item Knowledge about Attention Deficit Disorder Questionnaire (KADD-Q) was developed and administered in Perth, Western Australia to 256 teachers of, and 92 parents having children with ADHD (West et al, 2005). The findings indicated teachers and parents to be very knowledgeable about the causes of ADHD, but they lacked knowledge about its characteristics and treatment. In the same sample of teachers, primary school teachers were found to have higher levels of knowledge about ADHD than secondary teachers. Interestingly, in this context, parents knew significantly more than teachers about the causes and treatment of ADHD. Despite this, these outcomes highlight that both teachers and parents' are relatively ill-informed in their knowledge of ADHD.

Recent Australian research conducted by Efron, Sciberras, and Hassell (2008) explored parents' beliefs and attitudes towards schools' understanding of ADHD, ADHD information provided and general support. Sixty-six parents of ADHD children attending a paediatric clinic at the Centre for Community Child Health, Royal Children's Hospital, Melbourne were recruited. They completed an adapted version of the dosReis, Zito, Safer, Soeken, Mitchell and Ellwood (2003) Attitudes, Satisfaction, Knowledge, and Medication Experiences (ASK-ME) Questionnaire. Only 23% of parents agreed that 'most school teachers have a good understanding of ADHD'; half agreed schools are supportive of

children with ADHD; and 30% reported receiving some information from teachers about ADHD. The authors concluded that parents' perception of teachers' understanding of ADHD is poor, even though they are more than likely to turn to teachers to source ADHD information (Barbarese & Olsen, 1998; Bekle, 2004; Efron et al., 2008; Jerome et al, 1994; Kos et al., 2004; Sciotto et al., 2000; West et al., 2005).

9 The Current Study

The literature reviewed here articulates clearly that both teachers' and parents' knowledge about ADHD is somewhat deficient, particularly in the area of treatment. Moreover, there is some suggestion parents do not feel confident in teachers' understanding of ADHD. The present thesis, therefore, aims to explore and compare teacher and parent knowledge of and attitudes toward ADHD; and to examine whether teachers can be better prepared through specialist training for the ADHD-related challenges of their future profession.

One additional area of interest in the current study is parental perceptions of ADHD amongst parents of non-ADHD children. It is expected that these parents are likely to impact significantly on the nature of the school environment within which children with ADHD find themselves through the attitudes they share with their own children, and the pressure and expectations they bring to bear on teacher behaviour. This impact may be as subtle as excluding the child with ADHD from social activities, such as birthday parties and play-dates, or to more explicit demands that their child not be seated next to the 'disruptive' child in the class. To date, no research has considered the views of these parents, yet in number, they are potentially one of the main determinants of the school environment.

In sum, the current study will be in two parts. Study One will explore ADHD knowledge and attitudes of teachers, specifically (i) in-service teachers working with a child

with ADHD (ii) in-service teachers not working with a child with ADHD, and (iii) pre-service teachers. Additionally it will explore the ADHD knowledge and beliefs of parents, including (i) parents of children with ADHD, and (ii) parents without such a child. Further the behavioural strategies teachers' use in the classroom management of children with ADHD will be investigated. In study Two, this evidence base will then be used to inform the development and evaluation of a pre-service teacher training package to instantiate a preventative and systemic multimodal approach to ADHD responsiveness in the classroom.

As with most studies of knowledge, attitude or belief, self-report measures are a central methodological feature of this study. A detailed discussion of the design and measures used in each of the studies will be presented first to minimise repetition and also to minimise distraction from presentation of lengthy descriptive information about the scales in the body of the report on each study. This will be followed by a discussion of the rationale, methodology, procedures and findings for Study One and then Study Two.

CHAPTER 2: DESIGN AND INSTRUMENTATION

2.1 Design

This research exploring what teachers and parents believe and know about ADHD employed a survey based design. This design was chosen instead of an interview design as it was hoped that anonymity would encourage participation and disclosure on topics where participants may feel embarrassed about their lack of knowledge or misperceptions. A description of each of the survey measures used will now be presented.

2.2 Types of Measures

Three questionnaires were prepared for teachers and two for parents. These surveys were based on questionnaires that have been used in previous studies to measure the three domains of interest; ADHD knowledge, attitudes and the behavioural strategies teachers use in the classroom. They were also some of the few questionnaires with established psychometric properties for the intended group of respondents: Kos (2004) for the Self-Report ADHD Questionnaire for teachers; West et al (2005) for the KADD-Q for parents. Both of these questionnaires were derived from the same source questionnaire by Sciotto et al (2000) and so were also considered complementary. While West et al (2005) also used their questionnaire for teachers it has many more items than Kos' (2004) measure and is much more time consuming to complete. Given the extra material being required of teachers in addition to this survey, a pragmatic decision was made to adopt the shorter questionnaire. The trade-off for length and for psychometric soundness was an overlapping but different set of items for teachers and parents which constrained direct comparison in two analyses but, it was thought, would significantly increase the participation rate of teachers whilst not compromising the degree of detail in information sought from parents. Minor modifications were made to the original questionnaires and the rationale for these are described below. In contrast to other studies the questionnaires developed for this study invited written comments

from teachers in addition to their rating responses. It was intended that this might provide more detailed information on which to ground development of the pilot intervention and evaluation measures. Also, diaries were used for more detailed quantitative and qualitative profiling of specific teacher responses. Those questionnaire elements developed specifically for this study were created because of an absence of existing tools to measure some aspects of the three domains of interest. The questionnaires were piloted using a sample of six teachers and five parents to obtain feedback regarding the survey format and content. Details of the pilot study will be explained in the final part of this chapter. Coding procedures for data entry will not be discussed in this chapter and instead can be found in Electronic Appendix A.

2.3 Measures for Teachers

2.3.1 Self-Report ADHD Questionnaire for In-Service Teachers

The Self-Report ADHD Questionnaire for In-Service Teachers was used to assess practicing teachers' knowledge of, attitudes and behaviours toward children with a clinical diagnosis of ADHD. The current measure is modelled after the Self-Report ADHD Questionnaire developed by Kos (2004) containing six separate sections (See Appendix A for section descriptions and also the original Kos (2004) scale). The questionnaire was modified by the author in consultation with Dr Kos. That is, section A, B, D, F, G and H were derived from Kos' (2004) materials with a few minor modifications and/or formatting/typeface changes and sections E and C were primarily developed by the author for the current study. These sections will be discussed in detail in their respective sections. The measure (see Appendix B) is arranged in sections A to H and these sections will be detailed below. Table 2.1 summarises the instrumentation modifications made by the researcher in comparison to Kos' (2004) Self-Report ADHD Questionnaire. The rationale for each change will be presented as this discussion progresses.

This scale was chosen because (1) it measured three relevant aspects of ADHD knowledge, (2) it differentiated knowledge from attitudes and explored both with multiple items for greater detail, (3) it has been successfully used in past Australian research, (4) it has good psychometric properties ($\alpha = .78$ for the Knowledge Scale) and (5) it incorporated rating scales and diaries to give different perspectives.

Table 2.1

Summary of Instrumentation Modifications

Kos (2004)	Murray (2009)
Section A	Removal of analogue scale (as with sections D and E) and replaced with a Likert-type Scale. Item 8 (b) of Kos' (2004) ADHD measure omitted. Two additional questions added (Items, 5 and 7).
Section B	No modifications.
Section C	Kos' (2004) eight hypothetical vignettes were omitted. Redeveloped this section to measure specific behaviours teachers find the most challenging to manage in the classroom.
Section D	Item 63 of Kos' (2004) ADHD measure was omitted due to an oversight by the researcher.
Section E	Additional classroom management strategy added (instructional strategies).
Section F	Modifications made as per section E.
Section G	No modifications made.
Section H	No modifications made

Section A: Descriptive Demographic Details

This section of the questionnaire sought data on demographic characteristics such as gender, age, qualifications obtained, and teaching history (grade taught, number of students taught and currently teaching and total number of years teaching). Information was also collected on whether the participants' past university education involved any information about ADHD, as well as skill development to manage children with ADHD, using a yes or no response format. Teachers were also asked to record whether or not they had engaged in additional training regarding ADHD throughout their teaching experience using a yes or no response format. Participants who affirmed additional training were then asked to comment qualitatively on the nature, location of the training and whether it was helpful or not.

Teachers were also asked to indicate the number of students they had taught who were prescribed medication and if they had contact with prescribing physicians. Participants also indicated if they had ever taught a student who they suspected should have a diagnosis of ADHD. In contrast to Kos (2004), who employed a visual analogue scale, participants were asked to rate either Yes/No or Unsure as to whether they perceived they had the necessary knowledge and skills to fulfil their job requirements when dealing with children diagnosed with ADHD. Given a major disadvantage of analogue scales lie with the possibility of measurement error, a Likert-type scale was employed (DeVillis, 2003). Two additional questions were added to this section by the author, requiring teachers to indicate the name of the school they were currently teaching in and which socio-economic status (SES) indicator (i.e., "High income", "Middle income", and "Low income") best described the population served by the school in which they were employed. Teachers were also asked to indicate categorically whether their school employed people to help children with ADHD and comment on their assigned role in the classroom. In contrast to Kos (2004), participants were not asked to comment on the last time they taught a child with ADHD, as all participants

were required to be currently working with a student with ADHD to fill out this questionnaire.

Section B: Knowledge Regarding ADHD

In section B were 27 items developed by Kos (2004) to assess participants' knowledge of ADHD. Kos modelled the scale items from the scales used by Sciotto et al. (2000) and Jerome et al. (1994), and included additional items reflecting facts supported by empirical research. Each of the 27 items employed a True-False-Don't Know format to reduce guessing. There were no changes made to any of the Knowledge Scale items. However, the researcher chose to re-word items where Kos (2004) had made reference to "ADHD children" or "ADHD students" to instead read, "children with ADHD" or "students with ADHD" because the premise is that children are experiencing issues (e.g., have ADHD) rather than them being the problem (e.g., ADHD children). These amendments were also made for Sections C, D and F.

Section C: Challenging Behaviours

To assess the ADHD behaviours teachers may find the most challenging to manage in the classroom a new scale was developed because of an absence of any existing tool to measure the types of behaviours teachers find the most challenging to manage in the classroom. Thirty-six items were developed based on the Fourth Edition of the American Psychiatric Association Diagnostic criteria (DSM-IV, 2000) applied to children diagnosed with ADHD with the inclusion of items supported by empirical research. A series of Likert-type scale questions were divided into three sections: inattentive behaviours, hyperactive behaviours and impulsive behaviours. These sections were chosen to represent the essential features children with ADHD display. Under each section a list of 12 behaviours were provided for teachers to rate on a 5-point Likert-type scale the level of difficulty they experienced in managing the child's behaviour (e.g., "Not At All Difficult to "Very

Difficult”). For the purpose of this study, section C of Kos’ (2004) Self-Report ADHD Questionnaire, providing eight hypothetical vignettes, requiring participants to distinguish between a child with one of the three DSM-IV (APA, 1994) subtypes of ADHD or a typically developing child with some behavioural problems, was omitted. The researcher was primarily interested in collecting information on the specific behaviours teachers find the most challenging to manage in the classroom and, therefore, redeveloped this section of Kos’ questionnaire to evaluate this.

Section D: Attitudes Regarding ADHD

Teachers’ general beliefs about ADHD, as well as their attitudes about teaching students with ADHD were evaluated by 30 items presented in the form of a statement assessing beliefs about, and experiences of: a) ADHD and b) managing children with ADHD in the classroom. Item 63 “ADHD children have little control over the way they behave” of Kos’ (2004) ADHD measure was omitted due to an oversight by the researcher. The 30 items were represented on a 5-point Likert-type scale (1= Strongly Disagree to 5= Strongly Agree). Kos (2004) phrased some of the items positively and negatively to avoid potential response bias. Three items (90, 101 and 105) were reverse scored (see Appendix B). An example item is “I am limited in the way I manage a child with ADHD” (item 105).

Section E: Classroom Management Strategies One

This section was included to assess teachers’ beliefs about different classroom management strategies. Section E was modified from Kos (2004) on accordance with the research literature to include an additional classroom management strategy, *instructional strategies*. The researcher provided comprehensive examples of the six classroom management strategies (reinforcement, negative consequences, planned ignoring, classroom organisation and curriculum strategies, instructional strategies and emotional support) teachers may use to manage children with ADHD. Teachers were asked to rate each of the 39

items based on what they believed to be effective in managing their student's behaviour. In contrast to Kos (2004) who utilised a 10cm visual analogue scale with anchors ranging from "Strongly Agree" to "Strongly Disagree", the researcher instead retained the use of 5-point Likert-type scale ("Not At All Effective" to "Very Effective") to assess teachers' beliefs about the effectiveness of each of the classroom management strategies. An example item describing negative consequences is "Reprimanding the child for inappropriate behaviour- in front of the class" (item 109).

Section F: Classroom Management Strategies Two

This section was aimed to complement the first classroom management scale (see Section E) by assessing teachers' behaviour. The scale was designed to assess the behavioural strategies teachers currently used in the classroom management strategies. Again, teachers were asked to rate their beliefs regarding each of the 57 items on a 5-point Likert-type scale, with anchors ranging from "Strongly Disagree" to "Strongly Agree." An example item is "I would be able to effectively manage a student with ADHD by using reinforcement" (item 148).

Section G: Professional Development

This section was designed to identify teachers' beliefs towards engaging in further professional development in the area of ADHD. Despite the addition of one question asking teachers to record where they would obtain information if they needed further training in ADHD, the remainder of this section was identical to Kos (2004). Teachers were then asked to indicate whether they believed they would benefit from additional ADHD training. If they answered positively, they were then asked to tick the boxes that represented the aspects of ADHD they desired further education about. Lastly, teachers were asked to specify from which mode of learning they would derive the most benefit. Five options were presented to teachers requiring them to rate each option in order of preference. Additionally, an *other*

option was provided for those teachers who desired a different mode of learning to those listed. Space was provided for teachers to respond to this if needed.

Section H: Classroom Management (recording sheet and diary)

This section was designed for the current study to assess the frequency with which teachers use the six classroom management strategies (reinforcement, negative consequences, planned ignoring, classroom organisation and curriculum, instructional, and emotional support). All strategies assessed were identical to those of Kos (2004), apart from the addition of *instructional strategies*. The classroom management scale asked teachers to place a tick on the recording sheet, in the respective square, to indicate the number of times they performed a particular strategy each school day (see Appendix B). For example, if a teacher employed a negative consequence in response to a student's behaviour in the classroom, then the teacher would subsequently record a tick in the negative consequences square for that day.

This section also included a classroom management diary, designed by Kos (2004), to assess teachers' behaviour, as well as any possible antecedents for, and consequences of, implementing the particular behaviour management strategies. Additionally, the diary also enabled an assessment of the accuracy of teachers' identification of the strategies they reported using during the week. Teachers were asked to record (a) what they did (i.e., what was involved in the behaviour management strategy they used?) (b) what their student did to warrant the use of this particular behaviour management strategy, and (c) what the outcome was of using this particular behaviour management strategy, for a one-week period. Each time a strategy was detailed, teachers were also asked to record which one of the seven strategies they had just used (see Appendix B). Teachers were also provided with a copy of a description of the six behaviour management strategies to aid in completion of this section.

Teachers were informed in the initial questionnaire package that in order to fill out this questionnaire they must be currently working with a child diagnosed with ADHD. Given the likelihood of several students being diagnosed with ADHD in the classroom, teachers were encouraged to complete the questionnaire reporting on one student that they believed exhibited the most challenging behaviours for them in the classroom. In contrast to Kos (2004) the researcher chose not to collect individual data on each student, to prevent any concerns regarding the child being identified.

2.3.2 Questionnaire for In-Service Teachers

The second version of the questionnaire was designed to assess in-service teachers' knowledge and attitudes toward children with a clinical diagnosis of ADHD. However, this cohort was specifically required not to be currently working with a child with ADHD. Questions assessing demographics were the same as in-service teachers working with a child with ADHD with two exceptions: in-service teachers working with a child with ADHD were required to comment on the number of students with ADHD they had taught and/or were currently teaching, as well as if teachers had contact with children who were prescribed medication for ADHD and contact with their prescribing physicians. These questions were not relevant for in-service teachers not teaching a child with ADHD. Additionally, teachers were also asked to indicate whether they were a primary or secondary teacher. Sections B, D, and G of the Self-Report ADHD Questionnaire for In-Service Teachers were included and formed the remainder of the questionnaire (see Appendix C).

2.3.3 Self-Report ADHD Questionnaire for Pre-Service Teachers

The third questionnaire assessed pre-service teachers' ADHD knowledge and attitudes toward children with a clinical diagnosis of ADHD. Questions assessing demographics included: gender, age, qualifications obtained and currently studying for, and whether attending school experience and university training regarding ADHD. Similarly to

in-service teachers, pre-service teachers were also asked about their perceived knowledge and skills and to indicate their likeliness to engage in further training regarding ADHD. Sections B, D and G of the Self-report ADHD Questionnaire for In-service Teachers were included and again formed the remainder of the questionnaire (see Appendix D).

2.4 Measures for Parents

2.4.1 Self-Report ADHD Questionnaire for Parents

The Self-Report ADHD Questionnaire for Parents with a child with ADHD was designed to assess parents' knowledge, attitudes and behaviours toward children with a clinical diagnosis of ADHD. The structure of this questionnaire was modeled after the Self-Report ADHD Questionnaire for In-Service Teachers. That is, section C, E, F and H were modified to apply to parents. In line with the procedure used for teachers, a separate questionnaire was given to parents of primary children and secondary children, but these were identical in content (see Appendix E), differing only in their titles.

Section A: Descriptive Demographic Details

In addition to demographic characteristics (parent gender and age), the self-report questionnaire asked parents to record their child's age, grade and attending school. Parents were also asked to comment on what type of ADHD their child had been diagnosed with (e.g., Predominantly Inattentive Type, Predominantly Hyperactive/Impulsive Type and Combined Type) and whether their child had a comorbid condition and, if so, what type of condition.

Information was also collected on whether parents had engaged in any ADHD training and the details of this training (e.g., the nature and location of the training, and whether it was helpful or not). Parents were also asked to indicate if their child was currently taking medication and whether they had contact with their prescribing physician. Perceived

knowledge and skills was also assessed, requiring parents to indicate whether they felt they had the necessary knowledge and skills to deal with their child's diagnosis of ADHD. A Yes/No/Unsure format. Parents were then asked to list the out-of-school interventions and supports their child received (e.g., Psychologist, Paediatrician, Neurologist, Speech Therapy, Occupational Therapy, Tutoring, and Special Education). Parents were also asked to indicate whether their school employed people specifically to assist their child in the classroom and to comment on their role.

Section B: Knowledge and Beliefs about ADHD

This section of the questionnaire utilised West et al.'s (2005) questionnaire to assess parent's knowledge and beliefs about ADHD. This section uses The Knowledge about Attention Deficit Disorder Questionnaire (KADD-Q), a 67-item rating scale modelled after the 20-item Knowledge and Attention Deficit Disorders Scale (KADDS: Sciutto et al., 2000). Each of the items is phrased in the form of a statement about ADHD and applies a 'True', 'False' or 'Don't Know' format (see Appendix F). This format was employed in line with West et al. (2005) to differentiate between what parents know about ADHD and what they believe incorrectly about the condition (i.e. myths or perceptions). The scale is broken up into five subscales: prevalence, core characteristics, aetiology (causes), treatment, and prognosis. All of the items that constitute these scales are presented in the Appendix G. The term ADD used in the KADD-Q was amended to ADHD, to reflect the changes in the diagnostic terminology. In line with Sciutto et al. (2000) the KADD-Q included both positive and negative indicators of ADHD, to avoid potential response bias. This instrument was chosen for parents as it had good internal consistency ($\alpha = .93$) and this scale, unlike the Knowledge Scale used for teachers, targeted a greater number of home-relevant issues.

Section C: Challenging Behaviours One

To assess the ADHD behaviours parents find the most challenging to manage in the home environment, Section C (Challenging Behaviours) of the Self-Report ADHD Questionnaire for In-Service Teachers was included. This section was modified to refer to the behaviours parents find the most challenging to manage in the home. In line with the teachers' measure, parents were also asked to rate the level of difficulty they experience in managing their child's behaviour.

Section D: Challenging Behaviours Two

This section was designed as an extension of Section C, to further investigate the behaviours parents find the most challenging in the home. Firstly, parents were asked to indicate categorically whether there had been a time when their child's behaviours were so challenging that they felt they couldn't cope. If relevant, parents were then asked to describe what actually happened in this situation to make them feel this way, requiring them to comment on (a) what they were doing at the time (b) where they were (c) what behaviours their child exhibited (d) who else was present (e) what happened immediately after the event and (d) how they felt.

Section E: Home Management Strategies One

This section was modelled after Section E and F of the Self-Report ADHD Questionnaire for In-Service Teachers. Section E included seven strategies supported by research to reflect the main strategies parents employ in the home. These included negative consequences, planned ignoring, reinforcement, home environment strategies, organisational and time-management strategies, instructional strategies and emotional support. Parents were asked to rate each of the 37 items effectiveness in managing their child's behaviour. A 5-point Likert-type scale was used (1= Not At All Effective to 5= Very Effective).

Section F: Home Management Strategies Two

Participants were asked to rate their beliefs about each of the 49 items using a 5-point Likert-type scale (1= Strongly Disagree to 5= Strongly Agree).

Additionally, parents were asked to indicate whether they felt home strategies and classroom management strategies needed to be different in any way or the same in any way. Participants were also asked to further comment on what way they felt these strategies should be different or the same.

Section G: Personal Reflection:

In this section eight questions were designed to obtain qualitative responses about parents' feelings toward their child's progression through his/her schooling years to the present. Parents were asked to describe how they thought their child's behaviours may have affected their schooling years so far, how they have managed as a parent of a child with ADHD and what memories they have of their child's (primary/secondary) school years. Additionally, parents were also asked to further comment on the most significant events they recalled in their child's schooling. They were also asked to comment on what influence they felt teachers had on their child's development and success at school and what other factors they felt influenced their child's experience at school. Parents were asked to describe a teacher who had been supportive and one who had been less supportive in their child's schooling, as well as commenting on what they did that was helpful or unhelpful. Finally, parents were asked to record any advice they had for teachers about working with children with ADHD and, if anything, what would have made a difference for their child.

Section H: Assistance in Managing your Child's ADHD

This section was identical to section G of the Self-Report ADHD Questionnaire for In-Service Teachers (see section 2.3.1 for a description), but was modified to apply to parents.

Section I: Home Management Diary (recording sheet and diary)

This section was designed to assess the frequency with which parents used the seven home management strategies identified, namely, negative consequences, planned ignoring, reinforcement, home environment strategies, organisational and time-management strategies, instructional strategies, and emotional support. Similarly to teachers, parents were asked to place a tick in the respective square to indicate the number of times they performed a particular strategy each day (see Appendix E). This section also included a home management diary designed in line with Kos' (2004) classroom management diary, to assess parents' behaviour, as well as any possible antecedents for, and consequences of, implementing the particular behaviour management strategy. Additionally, the diary also enabled an assessment of the accuracy of parents' identification of the strategies they reported using during the week. Parents were asked to record (a) what they did (i.e., what was involved in the behaviour management strategy they used) (b) what their child did to warrant the use of this particular behaviour management strategy, and (c) what the outcome was of using this particular behaviour management strategy, for a one-week period. Each time a strategy was detailed, parents were also asked to record which one of the seven strategies they had just used (see Appendix E).

Parents were asked in the initial questionnaire package to fill out the Self-Report ADHD Questionnaire for Parents in relation to one child they have with ADHD. Given there was a chance parents might have more than one child with ADHD, parents were encouraged to pick which child they found exhibited the most challenging behaviours at home.

2.4.2 Questionnaire for Parents

The second questionnaire assessed the knowledge and attitudes of parents without a child with ADHD toward children with ADHD. Demographics assessed were collected on the gender and age of the parents. Parents were asked whether they knew any children with

ADHD, the name of the school their child was attending, their year level, and whether they knew if their school employed people specifically to help children with ADHD.

Sections B (Knowledge and Beliefs) and H (Assistance in Managing your Child's ADHD) of the Self-Report ADHD Questionnaire for Parents were included and formed the remainder of the questionnaire (see Appendix H).

2.5 Pilot Study

The purpose of the pilot study was to assess both the content and face validity of each of the instruments with the intention of preventing any potential problems from surfacing after the implementation of the measures. The questionnaires were piloted using a convenience sample of 11 participants (six teachers and five parents).

2.5.1 Participants

Teachers

The first sample included six teachers (two primary and four secondary) who had previously taught a child with ADHD. Of the six teachers (all female), two were recruited from Catholic primary schools and four from public secondary schools located in the Perth Metropolitan area. All teachers had at some stage taught a student with ADHD and had achieved a Bachelor of Education qualification. The number of ADHD students taught across the six teachers ranged from two to eight ($M = 4.50$, $SD = 2.74$). Overall teaching experience ranged from 3 to 30 years ($M = 13.0$ years, $SD = 13.24$ years) with the age of teachers ranging from 26 to 57 years ($M = 37.7$ years, $SD = 15.08$ years).

Parents

The parent sample comprised five parents (three primary and two secondary). The average age of parents ranged from 28 to 37 years, with a mean age of 34.4 years ($SD = 3.71$

years). Of these parents (all mothers), one knew a child with ADHD and three indicated their child's school employed expert staff in the classroom to work with children with ADHD.

2.5.2 Materials

The Self-Report ADHD Questionnaire for In-Service Teachers, Self-Report ADHD Questionnaire for Pre-Service Teachers, Questionnaire for Teachers, Self-Report ADHD Questionnaire for Parents and Questionnaire for Parents were used in the pilot study. The teachers' classroom management diary and parents' home management diary were also used in the pilot. The questionnaires were previously discussed in this chapter. A questionnaire evaluation form was developed for participants to record their responses from the evaluation (See Appendix I).

2.5.3 Procedure

Permission to conduct research was initially obtained from the Human Research Ethics Committee of Murdoch University, the Department of Education and Training, and the Catholic Education Office of Western Australia. The 11 potential participants were personal contacts of the researcher and were contacted via telephone and email and asked whether they would volunteer to participate in a pilot study requiring them to evaluate the content and design of the study instruments. All potential participants consented to take part and, consequently, questionnaires were sent to each participant's private address. Potential respondents were given one week to complete the questionnaire evaluation forms and return them, in a pre-stamped sealed envelope, to the Murdoch University Psychology Department. All participants were informed prior to taking part in the pilot study that their participation was completely voluntary and that their responses would remain anonymous. Of the 11 questionnaire evaluation forms distributed to parents and teachers, all were returned, giving a response rate of 100 percent.

Participants were asked to read each of the questionnaires and evaluate them in terms of their content and design. Although parents and teachers were asked to evaluate different questionnaires, the evaluative questionnaire remained the same for both. To evaluate the appropriateness of content, participants were asked to rate the questionnaires on a 5-point Likert-type scale (“Strongly Disagree” to “Strongly Agree”) in regards to their (a) suitability for the audience (e.g., parents or teachers), (b) ease of understanding (e.g., words used, whether directions were clear), (c) level of organisation (e.g., whether questions were logically organised or placed in a sufficient order), (d) ease of interpretation (e.g., whether questions were easily understood), and (e) whether sufficient examples were provided when necessary. Design was evaluated by determining whether each questionnaire met the following requirements including (a) satisfactory layout (e.g., whether the questionnaire had a simple and clear format), (b) appropriate length (e.g., whether the length of each questionnaire was appropriate), and (c) appropriate use of space and typeface (e.g., font, style). Additionally, participants were asked to indicate the length of time required to complete each of the questionnaires, and whether they recommended the insertion or elimination of questions. Participants were not required to complete the classroom management diary or the home management diary but were still required to make comments regarding their content and design.

2.5.4 Findings

The findings suggest all questionnaires exhibited content and face validity. Feedback from participants indicated that they found the survey formats easy to comprehend, logically designed, and appropriate for the audiences chosen. Further, it was shown that the time taken to complete each questionnaire was satisfactory, but time range depended on which questionnaire was being filled out. The time taken to fill out the questionnaires ranged from 15 minutes for the Questionnaire for Teachers and 13 to 15 minutes for the Questionnaire for

Parents ($M = 14.0$). Participants reported the Self-Report ADHD Questionnaire for Teachers took approximately 30 minutes and the Self-Report ADHD Questionnaire for Parents ranged from 30 to 35 minutes ($M = 31.6$). The Questionnaire for Pre-Service Teachers was not assessed here, however it was expected that completion time would be similar to that of the Questionnaire for Teachers and Parents, as they are both similar in length. This stage of questionnaire development resulted in no significant changes to the content or format of the questionnaire.

CHAPTER 3: STUDY ONE

3.1 Overview

This study was designed to explore teachers and parents knowledge of and attitudes toward children with ADHD. Consequently the aims of the study were:

- 1) To assess teachers' knowledge about ADHD, their attitudes toward children with ADHD and the behavioural strategies used in the classroom management of children with ADHD;
- 2) To assess pre-service teachers' knowledge about ADHD and attitudes toward children with ADHD;
- 3) To explore parents' knowledge about, and/or experiences of, having a child with ADHD in school.

Specific hypotheses included:

- | | |
|---------------|--|
| Hypothesis 1a | Teachers who are currently working with a child with ADHD will be significantly more knowledgeable about ADHD than teachers who are not working with a child with ADHD, who will, in turn, be more knowledgeable about ADHD than pre-service teachers. |
| Hypothesis 1b | Pre-service teachers who report having received training at university about ADHD will be significantly more knowledgeable than pre-service teachers who report not having received training about ADHD. |
| Hypothesis 1c | Parents of children with ADHD will be more knowledgeable than parents without children with ADHD. |

- Hypothesis 1d Attitudes toward children with ADHD will be positively related to knowledge about ADHD for all groups.
- Hypothesis 1e Knowledge will be significantly correlated with perceived knowledge and skills for both in-service and pre-service teachers.
- Hypothesis 1f Teachers' behavioural intention will be more positive if they are more accurately informed about ADHD.
- Hypothesis 1g Teachers and parents will be more knowledgeable about ADHD characteristics than treatment.

Exploratory analyses were then conducted to more carefully explore:

1. What similarities and differences there are in the particular facts 'known' and 'not known' by teachers, pre-service teachers and parents;
2. What similarities and differences there are in the particular attitudes held by experienced teachers, and pre-service-teachers;
3. What are the most commonly used behavioural strategies in-service teachers' use in the classroom management of children with ADHD; and
4. Whether training is desired by teachers, pre-service teachers and parents.

3.2 Method

3.2.1 Participants

The total sample comprised 138 participants (71 teachers and 67 parents). Teachers and parents were recruited from 15 government and 7 private schools using a convenience sample from local metropolitan schools in Perth, Western Australia.

The total sample was split into four subsamples: (1) teachers working with a child with ADHD, (2) a comparison group of teachers not working with a child with ADHD, (3) a group of pre-service teachers, and (4) a group of parents of children with ADHD, (5) a comparison group of parents without a child with ADHD. A description of each of the samples is provided below.

Teachers

Seventy-one teachers formed the total teacher sample. Demographic characteristics for the total sample of participating in-service teachers are presented in Table 3.1.

Sample One included 16 in-service teachers (7 primary and 9 secondary) who were currently working with a child with ADHD and were recruited from twelve public and four private schools. The age of the teachers ranged from 26 to 58 years ($M = 37.62$, $SD = 9.85$ years) with 87.5% of the sample being female and 12.5% male. Teachers in this sample reported an average of 13.23 years ($SD = 8.0$ years) of teaching experience. Only one respondent failed to fill out this item in the questionnaire.

Table 3.1

In-Service Teacher Descriptive Characteristics for Total Sample (n = 71)

Age (in years), <i>M</i> (<i>SD</i>)	40.87 (11.15)
Sex, % Female	84.5%
Qualifications, %	
Diploma	18.3
Bachelor Degree	38
Certificate	2.8
Diploma and Bachelor	35.2
Bachelor and Masters	5.6
Years of Teaching Experience, <i>M</i> (<i>SD</i>)	16.2 (10.35)
Type of Teacher, %	
Primary	78.9
Secondary	21.1
Type of School, %	
Private	43.7
Public	56.3
School SES, %	
Low SES	33.8
Middle SES	63.4
ADHD University Training, %	
Yes, information and skill development	29.6
None	70.4
Would Benefit from Additional Training, %	
Yes	94.4
No	2.8
Aspects of ADHD Information Required, %	
Assessment/diagnosis	81.7
Classroom management strategies	84.5
Cause and Treatment	74.6
Preferred Method of ADHD Training, % yes	
Seminar	33.8
Workshop	32.4

Note: *M*: mean; *SD*: standard deviation.

Sample Two included 55 in-service teachers who were not currently working with a child with ADHD ($M = 17.0$ years of teaching experience) who were selected from 49 primary schools (27 public and 28 private). Of this sample, 83.6% were female and 16.4% were males and the average age ranged from 23 to 64, with a mean age of 41.8 years ($SD = 11.41$ years).

Sample Three included 21 pre-service teachers from Murdoch University Perth, Australia who were completing an Education degree. Demographic characteristics of participating pre-service teachers are presented in Table 3.2.

Table 3.2

Pre-Service Teacher Descriptive Characteristics for Total Sample (n = 21)

Age (in years), <i>M</i> (<i>SD</i>)	30.1 (9.15)
Sex, % Female	85.7
ADHD University Training, %	
Yes, information and skill development	33.4
None	66.7
Would Benefit from Additional Training, %	
Yes	100
Aspects of ADHD Required, %	
Classroom management strategies	100
Treatment	90.5
Assessment/diagnosis/causes	85.7
Prognosis	81
Preferred Method of ADHD Training, % yes	
Seminar	33.3
Workshop	23.8

Note: *M*: mean; *SD*: standard deviation.

Parents

Sixty-seven parents formed the total parent sample. Demographic characteristics of participating parents are presented in Table 3.3.

Sample Four included a small body of parents ($n = 7$) of children with ADHD. Statistical analyses were not performed on this group. However, interesting qualitative findings are presented.

Sample Five included 60 parents who did not have a child with ADHD. Only 49 reported their gender (76.7 % female and 5 % male) and 45 reported their age ($M = 38.4$, $SD = 4.52$).

Table 3.3

Parent Descriptive Characteristics for Total Sample (n = 67)

Age (in years), <i>M</i> (<i>SD</i>) (n=45)	38.5 (4.50)
Sex, % Female (n= 49)	74.6
Child's Level of Schooling, %	
Primary	92.5
Secondary	7.5
Would Benefit from Additional Training, %	
Yes	53.7
No	46.3
Type of ADHD Information Required, %	
Treatment	53.7
Causes	52.2

Note: *M*: mean; *SD*: standard deviation.

3.2.2 Instrumentation

The self-report questionnaires used in this study included the Self-Report ADHD Questionnaire for In-Service Teachers, Questionnaire for In-Service Teachers, Self-Report ADHD Questionnaire for Pre-Service Teachers, Self-Report ADHD Questionnaire for Parents and the Questionnaire for Parents. The description and development of each of the self-report measures is detailed in Chapter Two. A copy of each of the measures is included in Appendices B, C, D, E and H, respectively.

3.2.3 Procedure

Permission to conduct the current research was obtained from the Human Research Ethics Committee of Murdoch University and from the Catholic Education Office (Perth). Of the 120 schools approached, 22 Principals agreed to participate. The Principals of these schools then approached individual teachers during staff meetings to seek their voluntary participation. Twelve Principals required my attendance at the next scheduled staff meeting to provide a brief summary of the study and subsequently distribute questionnaires to those teachers who were interested in volunteering. Remaining Principals required delivery of the questionnaires to them directly, or to one of the deputy principals, who then distributed them to the teachers. Participating teachers and principals then spoke to and emailed parents who they thought might be interested in participating in the study and, those who agreed, were

handed the parent information package. Unfortunately schools did not keep a record of the number of parents contacted.

The Principals from the 15 government and 7 private schools were mailed an information letter describing the purpose and significance of the research, and indicating to each principal that I would contact them by telephone within a week to determine if their school wished to participate (see Appendix J).

Each participating teacher was provided with a teacher information package which included a cover letter (see Appendix K), consent form (see Appendix L) an A4 envelope and the relevant ADHD Questionnaire. This procedure was also mirrored for parents who received a parent information package complete with a cover letter (see Appendix M), consent form (see Appendix N) and the relevant ADHD Questionnaire. Completed questionnaires were returned in a sealed envelope to the box provided in the main administration office at each school within two weeks. I then collected the box with the completed questionnaires after the two week completion period.

Of the 110 questionnaires delivered to teachers, 71 were returned, providing a response rate of 64.5%. The Principals of the 98 schools that declined the invitation to participate in the current study provided feedback to me about the main concerns and/or barriers preventing their schools participation in this research. Two core restraints included: 1. the time constraints and pressure placed on teachers to complete their already existing workload, and 2. several schools had already participated in a number of research projects or were currently participating in research for other university studies. However, all the principals that declined participation expressed that they were supportive of the current research project and believed that such an investigation is of considerable need due to the increasing prevalence of children with ADHD and the pertinent role teachers play in the identification and management of children with ADHD in the classroom.

As explained previously, given parents were mainly recruited through word of mouth via school Principals and teachers who had agreed to participate, the response rate for the parent sample was excellent with all measures given to parents returned.

Pre-service teachers were recruited in order to explore what they believed about and know about ADHD. Approval to conduct this study was gained from the Murdoch University Human Research Ethics Committee and the Murdoch Education Faculty. I then approached the Co-ordinator of the Professional Internship unit within the Faculty of Education at Murdoch University to seek approval to collect data from those students enrolled in the unit. I chose the Professional Internship because it aims to nurture the development of the reflective practitioner and establish a foundation for confronting the issues associated with the professional responsibilities of being a teacher. The unit consists of an initial two-weeks on-campus instruction prior to a six-week school-based internship and it concludes with two-weeks on-campus classroom activities as a preparation for the students' future profession.

The unit coordinator agreed to my attending two lectures, one presented to students at the main campus and one at a remote campus, for students enrolled in the professional issues unit and to my distributing a questionnaire in order to assess their knowledge of and attitudes toward children with ADHD. Participation was voluntary and participation in the study was kept separate from any assessment of course work.

I attended the last 20 minute of a lecture and provided students with a brief overview of the research and confidentiality procedures. Each of the pre-service teachers was given a questionnaire which included a cover page detailing the purpose of the study (see Appendix O). Prior to their participation, formal written consent was gathered from students who were willing to participate (see Appendix P). I then instructed participants to place their completed questionnaires into the box provided at the front of the room. I was not present while the

questionnaire was completed and only returned at the conclusion of the lecture to collect the box. The questionnaire took approximately 15 to 20 minutes to complete.

As a result of the very small sample of parents of children with ADHD and the difficulty in collecting data in 'real world' contexts, I approached local Community Newspapers, as well as, the Learning and Attentional Disorders Society (LADS) of Western Australia (W.A.) and one W.A ADHD parent support group to promote my research, in hope that such attention would improve the participant pool. Following this, information about my research was published in a local Community Newspaper (see Appendix Q) and, as a result, I was contacted by 89.7 Twin Cities Perth FM Radio station to take part in a chat show focusing on the nature of ADHD and the relevance of my research. Despite attending the radio chat show and prior publication of my research in a local newspaper, these efforts failed to improve the recruitment pool.

3.3 Results

3.3.1 Preliminary Psychometric Analysis of Scales:

Internal consistencies of the measures used in this study were estimated using Cronbach's alpha. The results obtained suggested the Self-Report ADHD Questionnaire for In-Service Teachers is an internally consistent measure of in-service teachers' knowledge about ADHD, their attitudes and their behaviours toward children with ADHD. The four scales: Knowledge, Challenging Behaviours, Attitude, and Classroom Management Strategies have internal consistency estimates of .75, .97, .64, .90, respectively. While the alpha for the Attitude scale is considerably lower than for the other scales, and less than the generally desirable limit of 0.7 (Nunnally, 1978), it falls within the acceptable range for a scale that encapsulates a range of attitudes rather than many items targeting a single attitude - in such instances one would expect some variability of items (Moss et al, 1998). Given the Questionnaire for In-Service Teachers and Self-Report ADHD Questionnaire for Pre-service

Teachers was made up of the identical Knowledge and Attitude Scales, and given the similarity in group characteristics no further reliability analyses were conducted on these scales. Disappointingly, no formal analyses were able to be conducted with the data pertaining to the Classroom Management Section (section Appendix B, section H) as only a few teachers responded to this section.

With reference to the Self-Report ADHD Questionnaire for Parents, the internal consistency of the Knowledge and Beliefs Scale for the total parent sample ($n = 67$) was measured at an alpha of .90. No formal analyses took place with the remaining scales: Challenging Behaviours (see Appendix E, section C and D) or Home Management Strategies (see Appendix E, section E and F) and the Home Management Diary (see Appendix E, section I), due to very low participant numbers ($n = 7$). Given the Questionnaire for Parents for parents without a child with ADHD was made up of the identical Knowledge and Beliefs Scale, no further reliability analyses were conducted on these scales.

All descriptive and formal analyses for Study One are presented in Electronic Appendix B.

3.3.2 Hypotheses Testing

The current study set out to investigate teachers' and parents' knowledge of and attitudes toward children with ADHD. It is important to mention that I have combined incorrect answers with 'don't know' responses to form a 'not known' category as a counterpoint to the 'known' (correct responses) category for both teachers' and parents' responses, in all formal analyses. This reduction of response options maximizes the power of all subsequent analyses given the sample sizes and large number of items. The 'not known' category captures a combined index of which areas of knowledge need targeting through provision of new information to counter an absence of information (don't know response) or remedial information to counter incorrect understandings (incorrect responses).

Seven hypotheses were tested and exploratory analyses were also conducted to answer four predefined questions.

Hypothesis 1a:

Two independent-samples t-tests were performed on the sum of scores from the 27-item knowledge scale to determine firstly, whether those teachers who report currently working with a child with ADHD would be significantly more knowledgeable than those not currently working with a child with ADHD, and, whether teachers currently working with a child with ADHD, in turn, would also be more knowledgeable than pre-service teachers. There was no significant difference in knowledge scores for those currently working with a child with ADHD ($M = 16.13$, $SD = 3.18$) and those who were not ($M = 15.49$, $SD = 4.76$), $t(69) = .50$, $p = .62$. There was also no significant difference in knowledge scores for those teachers working with a child with ADHD ($M = 16.13$, $SD = 3.18$) and pre-service teachers ($M = 15.05$, $SD = 5.24$), $t(33) = .77$, $p = .45$. Hypothesis 1a was not supported.

Hypothesis 1b:

An independent-samples t-test was performed on the sum of scores from the 27-item Knowledge Scale to determine whether those pre-service teachers who reported they had received training about ADHD at university would be more knowledgeable than those without any training. There was no significant difference in knowledge for those pre-service teachers reporting previous ADHD training at university ($M = 17.00$, $SD = 2.58$) and those without ($M = 14.07$, $SD = 6.01$); $t(18) = -1.56$, $p = .14$. Hypothesis 1b was not supported.

Hypothesis 1c

Given the small number of participants with a child with ADHD ($n = 7$), no formal analysis was conducted with this group. However, descriptive analyses were performed on responses of parents without a child with ADHD ($n = 60$). Table 3.4 illustrates the descriptive

analyses for parents' scores on the KADD-Q. In line with West et al. (2005) the prevalence and prognosis subscales were not included in the analysis due to the limited number of items.

Table 3.4

Descriptive Statistics for Parents' Scores on the KADD-Q (n = 60)

Subscale	No. of Items	Percent	M	SD
Total Correct	67	40.4	27.07	8.96
Causes	12	58.1	6.97	2.83
Characteristics	24	42.9	10.30	4.49
Treatment	26	34.3	8.93	3.64

Hypothesis 1d

Three Two-tailed Pearson product-moment correlations were conducted to examine the relationship between knowledge about ADHD and teachers attitudes towards children with ADHD for all three groups. The outcome of the correlations showed that there were no significant correlations between scores on the Knowledge Scale and attitudes for any of the three groups. Hypothesis 1d was not supported.

Hypothesis 1e

Two two-tailed Pearson product-moment correlations were conducted to examine the relationship between ADHD knowledge and perceived knowledge and skills for all three groups. A teachers' rating on perceived knowledge and skills is a subjective measure of their own belief about how much they know about ADHD. Knowledge scores are a more objective measure derived from the responses given to a list of questions designed to assess the degree to which teachers know empirically validated information about ADHD. As mentioned in Chapter Two, perceived knowledge and skills was measured by a single item with a Yes/No or Unsure format and ADHD knowledge is measured by summing the 27-item scores. The outcome of the correlation showed that there was a significant, moderate correlation between scores on the Knowledge Scale and perceived knowledge and skills for pre-service teachers

($r = .54$, $n = 21$, $p = .011$). No correlation between the two variables was found for the remaining groups. Therefore, Hypothesis 1e was only partially supported.

Hypothesis 1f

Two two-tailed Pearson product-moment correlations were conducted to examine the relationship between teacher's positive intention to use each of the six classroom management strategies over the next week and ADHD knowledge scores. Teachers' intentions to use each classroom strategy was measured via a 5-point Likert-type scale (e.g., "Strongly Disagree" to "Strongly Agree"). The outcome of the correlation showed that there was a significant, moderate correlation between scores on the Knowledge Scale and teachers' intentions to use appropriate classroom organisation and curriculum strategies ($r = .63$, $n = 16$, $p = .009$) and appropriate instructional strategies ($r = .53$, $n = 16$, $p = .034$). However, no relationship was found for the remaining classroom management strategies (i.e., reinforcement, negative consequences, planned ignoring and emotional support) and knowledge scores. Hypothesis 1f was partially supported.

Hypothesis 1g

Given that directly comparable measures were not used in this study, items on the Kos' scale for teachers were categorized into the same three subscales as devised by West et al. (2005): Causes (C), Characteristics (Ch), Treatment (T). West et al (2005) also included questions on prevalence ($n = 2$) and prognosis ($n = 3$) but these were not analyzed separately due to the small number of items. Items of relevance to these two subscales were also removed from the teacher Knowledge Scale (i.e., prevalence, $n = 2$ and prognosis, $n = 1$). This is the first time such a comparison has been presented in the literature and is done so that the reader can begin to appreciate some of the challenges in interpreting the published literature. Table 3.5 illustrates that there are significantly different numbers and content of items for both groups. Statistical analysis of this question was not meaningful because of (1)

the different content of the items for each group, (2) the total number of items (27 vs 67), and (3) relative number of items in each category (West et al., 2005: 12 Causes, 24 Characteristics and 26 Treatment; Kos, 2004: 7 Causes, 12 Characteristics and 5 Treatment). These differences are despite both questionnaires originating from the same original source (Sciutto, 2000). Descriptive analyses were performed on the summed scores of the ADHD characteristics items using the subscales defined by West et al (2004): Causes, Characteristics and Treatment to assess whether in-service teachers ($n = 71$) and parents of non-ADHD children ($n = 60$) would be more knowledgeable about characteristics than treatment. Table 3.6 illustrates the descriptive analyses for teachers and parents scores on the respective Knowledge Scales. The findings showed that teachers fared better on the Characteristics subscale with 67.7% correct when compared to their responses on the Treatment subscale with 57.4% correct. This was also found for parents without a child with ADHD, with an overall 42.9% correct for the Characteristics subscale and 34.3% on the Treatment subscale. To the extent that it was able to be assessed, therefore, the hypothesis was supported.

While the hypothesis was not directly assessing parents and teachers knowledge of the causes of ADHD, a secondary finding is that parents were found to be more informed about causes than characterises and treatment of ADHD, and teachers were less informed about causes and treatment than characteristics of ADHD. These findings are comparable with the literature.

Table 3.5

ADHD Knowledge Items on the Parent and Teacher Knowledge Scales (n = 131)

Knowledge Scale for Parents		Knowledge Scale for Teachers	
Item Description		Item Description	
Item	Causes subscale (n = 12)	Item	Causes subscale (n = 7)
1	Attention Deficit Disorder is caused by an allergic reaction	1	Children with ADHD are born with biological vulnerabilities toward inattention and poor self control
2	Attention Deficit Disorder is caused by family problems	2	ADHD is often caused by food additives
3	Attention Deficit Disorder is caused by ineffective discipline at home	3	ADHD can be inherited
4	Attention Deficit Disorder runs in families	4	The cause of ADHD is unknown
5	Attention Deficit Disorder is caused by inoculations	5	ADHD is the result of poor parenting practices
6	Attention Deficit Disorder is caused by neurological impairments	6	ADHD is caused by too much sugar in the diet
7	Attention Deficit Disorder is caused by a child not trying hard enough to control his/her own behaviour	7	Family dysfunction may increase the likelihood that a child will be diagnosed with ADHD
8	Attention Deficit Disorder is caused by the inconsistent application of rules and consequences		
9	Attention Deficit Disorder is caused by excessive exposure to environmental substances such as lead		
10	Attention Deficit Disorder is caused by a diet high in junk food		
11	Attention Deficit Disorder is caused by food sensitivities		
12	Attention Deficit Disorder is caused by inconsistent parenting		
Characteristics subscale (n = 24)		Characteristics subscale (n = 12)	
1	Children diagnosed with an Attention Deficit Disorder tend to talk excessively in class	1	There are a greater number of boys than girls with ADHD
2	Children diagnosed with an Attention Deficit Disorder tend to be accident prone	2	A child who is not over-active, but fails to pay attention, may have ADHD*
3	Children diagnosed with an Attention Deficit Disorder tend not to finish their assignments	3	Children with ADHD always need a quiet environment to concentrate
4	Children diagnosed with an Attention Deficit Disorder tend to have difficulties reading other people's social cues (e.g. body language, facial expressions)	4	Children with ADHD are usually from single-parent families
5	Children diagnosed with an Attention Deficit Disorder tend to blurt out answers in class	5	All children with ADHD are over-active
6	Children diagnosed with an Attention Deficit Disorder frequently are also diagnosed with another disorder	6	There are subtypes of ADHD
7	Children with an Attention Deficit Disorder experience difficulties in establishing strong family bonds	7	ADHD affects male children only
8	Children diagnosed with an Attention Deficit Disorder tend to have coordination problems	8	If a child can play Nintendo for hours, then s/he probably doesn't have ADHD

Table 3.5 Continued

9	Children with an Attention Deficit Disorder experience difficulties in forming adult relationships	9	Children with ADHD cannot sit still long enough to pay attention
10	Children with an Attention Deficit Disorder tend to have difficulties following rules	10	Children from any walk of life can have ADHD
11	Children diagnosed with an Attention Deficit Disorder tend to engage in dangerous activities	11	Children with ADHD usually have good peer relations because of their outgoing nature
12	Children diagnosed with an Attention Deficit Disorder tend to have poor handwriting	12	Children with ADHD generally display an inflexible adherence to specific routines and rituals
13	Children diagnosed with an Attention Deficit Disorder tend to be disorganized		
14	Most children diagnosed with an Attention Deficit Disorder act impulsively (they do things without thinking)		
15	Children diagnosed with an Attention Deficit Disorder tend to be quarrelsome		
16	Children diagnosed with an Attention Deficit Disorder tend to be inattentive		
17	All children diagnosed with an Attention Deficit Disorder appear to be constantly on the go		
18	Children diagnosed with an Attention Deficit Disorder tend to have poor concentration		
19	Children diagnosed with an Attention Deficit Disorder tend to have poor body posture (e.g. they appear to slouch, slump in their chair or sprawl across their desk)		
20	Children with an Attention Deficit Disorder have more behavioural problems in new situations than in familiar ones		
21	Children diagnosed with an Attention Deficit Disorder tend to be verbally aggressive		
22	Children diagnosed with an Attention Deficit Disorder tend to experience difficulties in forming and maintaining friendships		
23	Children diagnosed with an Attention Deficit Disorder tend to make careless errors		
24	In order for a child to be diagnosed with an Attention Deficit Disorder, symptoms of the disorder must have been present in the child prior to the age of 7 years		
Treatment subscale items (<i>n</i> = 26)		Treatment subscale (<i>n</i> = 5)	
1	Following stimulant medication, children with an Attention Deficit Disorder may become highly anxious (e.g. crying or worrying excessively)	1	If medication is prescribed, education interventions are often unnecessary
2	Providing a child with a firm male role model is an effective treatment for Attention Deficit Disorder	2	If a child responds to stimulant medications (e.g., Ritalin) then they probably have ADHD
3	Following stimulant medication, children with an Attention Deficit Disorder may experience mood swings	3	Diets are usually not helpful in treating most children with ADHD
4	Stimulant medication increases a child's ability to follow rules	4	Medication is a cure for ADHD
5	Stimulant medication increases IQ	5	Research has shown, prolonged use of stimulant medications lead to increased addiction (ie., drug, alcohol) in adulthood
6	Stimulant medication causes insomnia or disrupted sleep patterns		

Table 3.5 Continued

7	Following stimulant medication, children diagnosed with an Attention Deficit Disorder are more able to pay attention
8	Special diets (e.g. reduced sugar, wheat free, milk free, additive free) are an effective treatment for Attention Deficit Disorder
9	Dietary supplements such as fish oils are an effective treatment for Attention Deficit Disorder
10	Currently, a combination of medication and behaviour management is a highly recommended form of treatment for Attention Deficit Disorder
11	Special parenting techniques are an effective treatment for Attention Deficit Disorder
12	Following stimulant medication, children with an Attention Deficit Disorder tend to experience improvements in their relationships with peers, parents and teachers
13	Social skills training is an effective treatment for Attention Deficit Disorder
14	Following stimulant medication children with an Attention Deficit Disorder may experience tics (motor movements and uncontrolled vocal sounds)
15	Stimulant medication works for all children diagnosed with an Attention Deficit Disorder
16	Stimulant medications is the single most effective treatment for Attention Deficit Disorder
17	Attention Deficit Disorder can be treated effectively by structuring a child's environment (e.g. making lists or having a routine)
18	Electroconvulsive Therapy (ECT) is an effective treatment for Attention Deficit Disorder
19	Biofeedback is an effective treatment for Attention Deficit Disorder
20	Stimulant medication reduces or suppresses appetite
21	Stimulant medication is addictive
22	Slow-release stimulant medication needs to be taken only once during the school day
23	Stimulant medication works within five minutes of taking it
24	Stimulant medication increases concentration
25	Homeopathic remedies are an effective treatment for Attention Deficit Disorder
26	The effects of a single dose of stimulant medication lasts for six to seven hours

Note: Items including questions on prevalence and prognosis are not included.

Table 3.6

Descriptive Statistics for Parents' and Teachers' Scores on Subscales (n = 131)

Subscale	Parents				Teachers			
	Items	Percent	M	SD	Items	Percent	M	SD
Causes	12	58.1	6.97	2.83	7	42.4	2.97	1.44
Characteristics	24	42.9	10.30	4.49	12	67.7	8.13	2.27
Treatment	26	34.3	8.93	3.64	5	57.4	2.87	1.22

Note: Items including questions on prevalence and prognosis are not included.

3.3.3 Exploratory Analyses

As previously mentioned, exploratory analyses were conducted to more carefully investigate a number of questions. These are as follows:

What similarities and differences there are in the particular facts 'known' and 'not known' by teachers, pre-service teachers and parents?

In-Service and Pre-Service Teachers ADHD Knowledge

The proportion of 'known' (correct responses) and 'not known' (incorrect/don't know) items were analysed for teachers. Table 3.7 shows the percentage of correct responses for each of the 27 knowledge items for teachers working with and those working without a child with ADHD in their classroom. The items most commonly answered correctly by both in-service and pre-service teachers were items relating to the characteristics of ADHD. In-service teachers and pre-service teachers almost unanimously understand that children from any walk of life can have ADHD. In addition, all participants were insightful about the gender specific issues that are commonly associated with ADHD, with 93.8% of in-service teachers working with a child with ADHD, 87.3% of those without, and 90.5% of pre-service teachers correctly identifying that ADHD doesn't only affect male children. An important finding in relation to the treatment of children with ADHD is that 75% of in-service teachers working with a child with ADHD, 85.5% of in-service teachers without and 81% of pre-service teachers were aware that if medication is prescribed, educational interventions are still necessary.

There were many items commonly 'not known' by teachers and pre-service teachers. For example, 68.8% of in-service teachers working with a child with ADHD, 85.5% without and 81 % of pre-service teachers responded that research has shown prolonged use of stimulant medications leads to increased addiction (i.e., drug, alcohol) in adulthood, which is not consistent with the current literature. Over 80% of pre-service teachers did "not know" the answer to the question relating to children with ADHD generally displaying an inflexible adherence to specific routines and rituals. The remaining groups did not fare much better in that over 50% of in-service teachers with a child with ADHD and 69.1% of those without also did not know this answer. Of particular concern is that 75% of in-service teachers working with a child with ADHD, 61.8% of in-service teachers without and, 57.1% of pre-service teachers believed ADHD is caused by food additives.

To further investigate differences in the three groups a one-way analysis of variance (ANOVA) was conducted for each item to investigate which items were answered significantly differently across the three groups of teachers. Using a $p < .01$ to acknowledge the risk of Type 1 errors, the ANOVA showed no differences between groups either at an item level or a whole-test level. Although one item showed a significant difference between groups this item violated the homogeneity of variance assumption and therefore was not considered further. This item is marked with an asterisk in Table 3.7.

Table 3.7

Percentage of 'Known' (Correct) Responses on ADHD Knowledge Items for Teaching Samples (n=92)

Item	Description	In-service Teachers (with) (n = 16) % Correct	In-service Teachers (without) (n = 55) % Correct	Pre-service Teachers (n = 21) % Correct
16	There are a greater number of boys than girls with ADHD (T)	68.8	67.3	71.4
17	There is approximately 1 child in every classroom with a diagnosis of ADHD (T)	31.2	27.3	52.4
18	If medication is prescribed, educational interventions are often unnecessary (F)	75	85.5	81
19	Children with ADHD are born with biological vulnerabilities towards inattention and poor self control (T)	43.8	45.5	23.8
20	If a child responds to stimulant medication (e.g., Ritalin) then they probably have ADHD (F)	56.2	47.3	71.4
21	A child who is not over-active, but fails to pay attention, may have ADHD (T)	50	60	42.9
22	ADHD is often caused by food additives (F)	25	38.2	42.9
23	ADHD can be diagnosed in the doctor's office most of the time (F)	75	65.5	52.4
24	Children with ADHD always need a quiet environment to concentrate (F)	68.8	43.6	57.1
25	Approximately 5% of Australian school-aged children have ADHD (T)	25	25.5	47.6
26	Children with ADHD are usually from single parent families (F)	62.5	74.5	57.1
27	Diets are usually not helpful in treating most children with ADHD(T)	68.8	56.4	71.4
28	ADHD can be inherited (T)	43.8	41.8	28.6
29	Medication is a cure for ADHD (F)	75	78.2	66.7
30	All children with ADHD are over-active (F)	62.5	87.3	66.7
31	There are subtypes of ADHD (T)	75	65.5	66.7
32	ADHD affects male children only (F)	93.8	87.3	90.5
33	The cause of ADHD is unknown (T)	31.2	32.7	52.4
34	ADHD is the result of poor parenting practices (F)	68.8	83.6	71.4
35	If a child can play Nintendo for hours, than s/he probably doesn't have ADHD (F)	68.8	74.5	81
36*	Children with ADHD cannot sit still long enough to pay attention (F)	81.2	50.9	28.6

Table 3.7 Continued

37	ADHD is caused by too much sugar in the diet (F)	87.5	61.8	66.7
38	Family dysfunction may increase the likelihood that a child will be diagnosed with ADHD (T)	50	36.4	38.1
39	Children from any walk of life can have ADHD (T)	87.5	94.5	90.5
40	Children with ADHD usually have good peer relations because of their outgoing nature (F)	62.5	72.7	52.4
41	Research has shown that prolonged use of stimulant medications leads to increased addiction (i.e., drug, alcohol) in adulthood (F)	31.2	14.5	19
42	Children with ADHD generally display an inflexible adherence to specific routines and rituals (F)	43.8	30.9	14.3

Note: Item numbers are those that appear in the Self-Report ADHD Questionnaire for In-Service Teachers

Parents without a Child with ADHD

The scale used to assess parents' knowledge allows for differentiation between what parents 'know' about ADHD and what is 'not known' about the condition (i.e. myths or perceptions). Given, no previous research has considered parents without a child with ADHD, additional detail was considered in this part of the study by exploring not just the items correct and incorrect, but what parents report that they 'don't know' about ADHD. This level of detail will help future researchers think about what kind of school-community level education about ADHD might be most effective.

There were many items in regards to characteristics that parents commonly answered correctly (see Table 3.8). More than 80% of parents responded correctly that children diagnosed with ADHD tend to have poor concentration and can be inattentive. Furthermore, 83.3% of parents correctly identified that children with ADHD act impulsively, as well as have difficulty following the rules (81.7%). Of significance, 95% of parents identified that a combination of medication and behaviour management is currently a highly recommended form of treatment for ADHD. A further 81.4% also answered correctly that ADHD is not caused by a child not trying hard enough to control his/her own behaviour.

Table 3.8

Percentage of Correct Responses on ADHD Knowledge Items for Parents (n = 60)

Item	Description	Subscale	Percentage
32	Currently, a combination of medication and behaviour management is a highly recommended form of treatment for ADHD (T)	T	95
64	Children diagnosed with ADHD tend to have poor concentration (T)	CH	88.3
56	Most children diagnosed with ADHD act impulsively (they do things without thinking) (T)	CH	83.3
44	Children with ADHD tend to have difficulties following the rules (T)	CH	81.7
61	Children diagnosed with ADHD tend to be inattentive (T)	CH	81.4
57	ADHD is caused by a child not trying hard enough to control his/her own behaviour (F)	C	81.4

Note: Item numbers are those that appear in the Self-Report ADHD Questionnaire for Parents

There were many items parents answered incorrectly (see Table 3.9). A high proportion of parents (63.3%) believed all children with ADHD appear to be constantly on the go and 48.3% responded incorrectly that stimulant medication is the single most effective treatment for ADHD. Of the total sample, 43.3% of parents believed that ADHD can be treated effectively by structuring the child's environment and that social skills training is an effective treatment for ADHD. Perhaps the most worrying is that 40% of parents incorrectly answered that special diets are an effective treatment for ADHD. Each of these beliefs may lead parents without a child with ADHD to negatively judge the parents of children with ADHD.

Table 3.9

Percentage of Incorrect Responses on ADHD Knowledge Items for Parents (n = 60)

Item	Description	Subscale	Percent
63	All children diagnosed with ADHD appear to be constantly on the go (F)	CH	63.3
26	Special diets (e.g., reduced sugar, wheat free, milk free, additive free) are an effective treatment for ADHD (F)	T	50
50	Stimulant medication is the single most effective treatment for ADHD (T)	T	48.3
51	ADHD can be treated effectively by structuring a child's environment (e.g., making lists or having a routine) (F)	T	43.3
39	Social skills training is an effective treatment for ADHD (F)	T	40

Note: Item numbers are those that appear in the Self-Report ADHD Questionnaire for Parents

The highest proportions of the most common 'don't know' responses are presented in Table 3.10. It appears that the main uncertainties or perceptions parents share are related to treatment of ADHD. There were many items parents listed as 'don't know' particularly concerning treatment. For example, 91.7% of parents could not identify whether or not biofeedback is an effective treatment for ADHD or whether Electroconvulsive Therapy is an effective treatment for ADHD (78%). Parents were uncertain of the prevalence rates of school-aged children with ADHD, with 81.4% being undecided in their response to item 28. Parents also answered 'don't know' (75%) to item 45, which stated that following stimulant medication children with ADHD may experience tics (motor actions and uncontrolled vocal sounds). Lastly, parents were also undecided about the effects of stimulant medication, responding uncertainly to item 74.

Table 3.10

Percentage of Don't Know Responses on ADHD Knowledge Items for Parents (n = 60)

Item	Description	Subscale	Percent
54	Biofeedback is an effective treatment for ADHD (F)	T	91.7
28	ADHD occurs in approximately 5% of all school-aged children (T)	P	81.4
52	Electroconvulsive Therapy (ECT) is an effective treatment for ADHD (F)	T	78
74	The effects of a single dose of stimulant medication lasts for six to seven hours	T	76.7
45	Following stimulant medication children with ADHD may experience tics (motor actions and uncontrolled vocal sounds) (T)	T	75

Note: Item numbers are those that appear in the Self-Report ADHD Questionnaire for Parents

Shared Understanding: The ADHD facts known and not known about ADHD by In-Service Teachers and Parents

While overall the analysis in hypothesis g showed teachers and parents to know (correct responses) more about characteristics than treatment, further exploratory analyses were conducted. As mentioned previously, given directly comparable measures were not used in this study for teachers and parents, only items with a high degree of similarity were explored (see Table 3.11). Items were categorized into the same three subscales as devised by West et al. (2005): Causes (C), Characteristics (CH), Treatment (T). When strictly looking at the proportion of correctly answered items, parents fared better than teachers on the items pertaining to the core characteristics of ADHD with parents scoring over 80% on two out of three of these items. Surprisingly, in terms of treatment, more than half of teachers were aware that diets are not usually helpful in treating most children with ADHD, in comparison to only 5 % of parents. A further 57.7% of teachers and only 16.7% of parents answered correctly and disagreed with the statement that those children with ADHD cannot sit still long enough to pay attention. Interestingly, 80.3% of teachers answered correctly that ADHD is not the result of poor parenting practices, whereas only 63.3% of parents responded correctly to this item. On the remaining items teachers and parents fared similarly. It is noted that the

different wording on these items in the parent and teacher questionnaire may have influenced these analyses.

Table 3.11

ADHD Knowledge Item Comparison Between Teachers and Parents

Parents (<i>n</i> = 60)		Teachers (<i>n</i> = 71)		
Subscale	Item Description	% Correct	Item Description	% Correct
Ch	Children diagnosed with ADHD tend to have poor concentration (T)	88.3	A child who is not over-active, but fails to pay attention, may have ADHD (T)	57.7
Ch	Children with ADHD tend to have difficulties following rules (T)	81.7	Children with ADHD generally display an inflexible adherence to specific routines and rituals (F)	33.8
Ch	All children diagnosed with ADHD appear to be constantly on the go (F)	16.7	Children with ADHD cannot sit still long enough to pay attention (F)	57.7
T	Special diets (e.g. reduced sugar, wheat free, milk free, additive free) are an effective treatment for ADHD (F)	5	Diets are usually not helpful in treating most children with ADHD (T)	59.2
T	Stimulant medication is addictive (F)	11.7	Research has shown that prolonged use of stimulant medications leads to increased addiction (i.e., drug, alcohol) in adulthood (F)	18.3
C	ADHD runs in families (T)	36.7	ADHD can be inherited (T)	42.3
C	ADHD is caused by food sensitivities (F)	32.2	ADHD is often caused by food additives (F)	35.2
C	ADHD is caused by inconsistent parenting (F)	63.3	ADHD is the result of poor parenting practices (F)	80.3

What similarities and differences are there in the particular attitudes held by experienced in-service teachers and pre-service-teachers?

To investigate the differences in in-service and pre-service teachers' attitudes a one-way analysis of variance (ANOVA) was conducted to investigate which items were answered significantly differently across the two groups of teachers. A more conservative alpha level ($p < .01$) was used, in recognition of the increased risk of Type 1 errors when considering such a large number of items with relatively few participants. Three items (106, 107 and 108) were removed prior to the analysis, as they were not relevant to pre-service teachers. Only statistical results where the homogeneity of variance assumption was met are presented, given the unequal group sizes across all items. Therefore one item (105) that was statistically significant was left out.

Descriptive statistics for each of the Attitude items for teachers are displayed in Table 3.12. When examining the differences between the three samples, it appeared that teachers genuinely had some insight into the limitations of their expertise when managing a child with ADHD in the classroom. Pre-service teachers were significantly less likely to agree that they have the skills to deal with children with ADHD in their class when compared to both in-service groups, $F(2, 88) = 9.75, p .000$. Pre-service teachers were also significantly more likely to disagree with the statement "I have the ability to effectively manage students with ADHD" than in-service teachers without a child with ADHD, $F(2, 88) = 8.39, p = .000$. There were no other differences in attitudes found among the groups. This perhaps indicates the level of the similarity in regards to attitudes towards children with ADHD across the three groups of teachers.

Table 3.12

Descriptive Statistics for Each of the 30 Attitude Items for Teachers

Item	In-service Teachers (with) (<i>n</i> = 16)		In-service Teachers (without) (<i>n</i> = 55)		Pre-service Teachers (<i>n</i> = 21)		
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	
79	ADHD is a valid diagnosis	3.94	1.00	3.81	.81	3.90	.79
80	ADHD is an excuse for children to misbehave	2.38	1.50	2.22	1.15	2.09	.77
81	ADHD is diagnosed too often	3.80	1.08	3.76	.93	4.24	.77
82	ADHD is a behavioural disorder that should not be treated with medication	2.69	1.08	2.48	.86	2.81	.98
83	All children with ADHD should take medication	2.25	1.12	2.26	.81	2.14	.65
94	Medications such as Ritalin and Dexamphetamine should only be used as a last resort	4.06	1.18	3.87	.86	3.86	.96
85	ADHD is a legitimate educational problem	4.00	1.03	3.94	.97	3.81	.98
86	Having a child with ADHD in my class would disrupt my teaching	3.38	1.15	3.25	1.08	3.24	1.14
87	I would feel frustrated having to teach a child with ADHD	2.62	1.26	2.62	1.10	2.81	.93
88	Young children with ADHD should be treated more leniently than older children with ADHD	1.69	.48	2.11	.74	2.35	.88
89	Children with ADHD should be taught by special education teachers	2.06	1.24	2.18	.86	2.33	.97
90	I would prefer to teach a student who was over-active than one who was inattentive	3.13	.89	3.22	.88	2.86	.85
91	Most students with ADHD don't really disrupt classes that much	2.69	1.01	2.41	.81	2.86	.96
92	Children with ADHD should not be taught in the regular school system	1.56	.51	1.85	.85	2.19	.98
93	The extra time teachers spend with students with ADHD is at the expense of students without ADHD	3.31	1.20	3.47	1.14	3.19	1.12
94	Other students don't learn as well as they should when there is a child with ADHD in the class	2.60	1.30	2.84	1.03	2.76	1.04

Table 3.12 Continued

95	You cannot expect as much from a child with ADHD as you can from other children	1.87	.96	2.05	.85	2.05	.92
96	Children with ADHD could control their behaviour if they really wanted to	3.00	1.15	2.37	.85	2.35	.88
97	Children with ADHD misbehave because they are naughty	2.50	1.32	2.00	.61	2.05	.92
98	Children with ADHD cannot change the way they behave	1.69	.60	2.18	.64	2.00	.63
99	Students with ADHD could do better if only they'd try harder	2.53	1.19	2.47	.84	2.29	1.01
100	Children with ADHD misbehave because they don't like following rules	2.50	1.39	2.24	.82	1.90	.70
101	Students with ADHD are just as difficult to manage in the classroom as any student	3.00	1.46	3.02	.97	3.90	1.14
102	Managing the behaviour of students with ADHD is easy	2.12	.81	2.02	.63	2.15	.75
103	I have the skills to deal with children with ADHD in my class	3.19	1.17	3.18	1.04	2.00	1.03
104	I have the ability to effectively manage students with ADHD	3.19	1.17	3.25	1.00	2.15	1.09
105	I am limited in the way I manage a child with ADHD	2.88	1.41	3.20	.99	4.00	.86
106	My school has policies that regulate how teachers manage a child with ADHD	2.73	1.16	2.60	.93	3.00	.49
107	Other staff influence how I would manage a child with ADHD	3.00	1.21	2.89	1.07	3.35	.67
108	Parents of students with ADHD influence how I would manage a child with ADHD	3.38	.08	3.12	1.05	3.48	.81

Note: Item numbers are those that appear in the Self-Report ADHD Questionnaire for In-Service Teachers

What are the most commonly used behavioural strategies in-service teachers use in the classroom management of children with ADHD?

Challenging Behaviours

The ADHD behaviours in-service teachers find the most challenging to manage in the classroom were investigated for the sample of teachers working with a child with ADHD ($n = 16$). Surprisingly, on average teachers were more likely to agree that the three distinctive ADHD behaviours were similar in their level of difficulty: Inattentive ($M = 2.57, SD = .78$), Hyperactive ($M = 2.63, SD = .94$) and Impulsive ($M = 2.79, SD = 1.09$), with a majority agreeing they were of some difficulty. However, these results are viewed tentatively due to the small sample size ($n = 16$).

Attitude Toward Classroom Management Strategies

Teachers' perceptions about the effectiveness of using each of the six classroom management strategies were then assessed. Table 3.13 displays the means and standard deviations for teachers' attitudes towards each classroom management strategy with a higher mean score indicated a more positive attitude (closer to 5 "very effective") and a lower mean score indicating a negative attitude toward the strategy (closer to 1 "not at all effective"). A mean score of 3 indicates that teachers held a more neutral belief about the item.

Teachers' overall beliefs about the different classroom management strategies employed in the classroom did not differ greatly across strategies. Inspection of the means showed that in-service teachers were more than likely to believe that all the classroom management strategies, apart from negative consequences, were somewhat effective in managing a child with ADHD in the classroom.

It is concerning that teachers do not view negative consequences in a more positive light, but these results are tentative, given the small sample size ($n = 16$).

Table 3.13

Descriptive Statistics for Teachers' Attitudes Toward Each Classroom Management Strategy (n = 16)

Attitude Domain	Mean	SD
Attitude toward negative consequences	2.85	.57
Attitude toward planned ignoring	3.50	.89
Attitude toward reinforcement	3.81	.79
Attitude toward classroom organisation/curriculum	3.47	.70
Attitude toward instructional	3.56	.70
Attitude toward emotional support	3.38	.76

Mean scores were also calculated (see Appendix C) on the individual items assessing teachers' use of each of the six classroom management strategies. Again, a higher mean score indicated a more positive attitude (closer to 5 "Strongly Agree") to a lower mean score indicating a negative attitude toward the strategy (closer to 1 "Strongly Disagree"). A mean score of 3 indicates that teachers held a more neutral belief about the item.

The outcome of these analyses showed that teachers were more likely to agree that they would be able to effectively manage a student with ADHD by using strategies such as reinforcement ($M = 4.12$, $SD = .34$) classroom organisation and curriculum ($M = 4.25$, $SD = .45$), instructional strategies ($M = 4.06$, $SD = .25$) and offering emotional support ($M = 4.06$, $SD = .68$). However, they were more neutral with their views about the use of negative consequences ($M = 3.06$, $SD = 1.12$) and planned ignoring ($M = 3.69$, $SD = .95$). When asked whether teachers believe they have control over which classroom management strategies they use in their classroom, all teachers tended to agree that they do have control over the choice of classroom management strategies they employ in the classroom. Teachers were more likely to disagree with the statement that numerous obstacles may prevent them from employing these strategies. While a majority inferred that they were more than likely over the week to make an effort to use reinforcement, classroom organisation and curriculum strategies and emotional support, more so than the other strategies, they remained neutral when asked to comment on whether it is important to them that other staff approve of the way they manage a student with ADHD. Of importance, teachers were more likely to agree that

parents' approval of the way they manage children with ADHD in classroom is important to them ($M = 3.73$, $SD = 1.22$).

What experiences face parents when raising a child with ADHD?

As mentioned previously, no formal analysis was conducted on the responses of parents with a child with ADHD group ($n = 7$) due to the small sample size. However, it is informative to highlight some of the insights and experiences parents face in parenting a child with ADHD. As displayed in Table 3.14 parents reported that their children struggle with the common inattentive and/or uninhibited behaviours children with ADHD exhibit.

Unsurprisingly, they also described that these behaviours impact significantly on their child's education in regards to their lowered self-esteem, academic underachievement and peer isolation. Research into ADHD has shown that the increased need of a child with ADHD for parental love and guidance places great demands on parents and often this can lead to parents questioning their own adequacies in providing such care. To illustrate, when parents were asked to indicate how they have managed as a parent of a child with ADHD, one described *"It has been tough. Sometimes felt as though I was bashing my head against a brick wall trying to get help"*. These difficulties are not viewed in isolation; parents also describe the exhaustion and frustration that go hand in hand when raising a child with ADHD.

It is also apparent that most of these parents strongly held the belief that teachers play a significant role in their child's development and success at school, particularly a teacher who is understanding, compassionate and motivating. Of particular interest, when parents were given the opportunity to indicate what advice they may provide to teachers about working with children with ADHD, a majority felt teachers need to provide individual care, consistent boundaries and continual support and understanding.

Table 3.14

Qualitative Items and Verbatim Responses From Parents of Children with ADHD (n = 7)

Items and Responses	
1	<p>Describe how you believe your child's behaviors may have affected their schooling years so far?</p> <p>My child has fallen considerably behind in his school work due to his inattentive behaviors, despite my continual concerns for his progress</p> <p>My child lacks confidence and often gives up easily</p> <p>He was always in trouble and failing school until we put him on medication</p> <p>He can't stay focused and gives up easily</p> <p>Delayed friendships and delayed learning</p>
2	<p>Describe how you have managed as a parent of a child with ADHD?</p> <p>As best I can</p> <p>It has been tough. Sometimes felt as though I was bashing my head against a brick wall trying to get help.</p> <p>I can be impatient and sometimes I yell. I feel exhausted. I have learnt ways to deal with situations and try to stay positive</p> <p>I manage with a lot of frustration but learned to repeat instructions with more patience</p> <p>I have two children with ADHD, so structure and positive reinforcement are big in my house</p> <p>I manage stressfully, successfully, honestly and always making my best efforts</p>
4	<p>What influence do you feel teachers have on your child's development and success at school?</p> <p>They have a huge influence. We have had good years due to the understanding of a teacher willing to build my child's self-esteem</p> <p>Teachers with 22 kids can only do so much</p> <p>I think the right teacher is very important, one who understands the child's disorder and sets teaching up for the child that is structured to deal with the highs and lows of medication</p> <p>I have not seen a teacher that has been able to motivate him, as he requires a lot of attention</p> <p>They have the biggest influence – some good and some bad</p>
5	<p>What advice can you give to teachers about working with children with ADHD?</p> <p>Don't give up on them. Most of them are great kids and they just have a chemical imbalance in their brains</p> <p>Set boundaries and stick to them</p> <p>Teachers need to give a child lots of one-on-one teaching and encouragement</p> <p>Continual support and understanding</p> <p>Get to know the child and embrace some of their differences and set them up for the positive not the negative</p> <p>Patience</p>

Whether training is desired by teachers, pre-service teachers and parents.

In-Service Teachers

Descriptive analysis of responses showed that of the 71 in-service teachers sampled, only 21 (29.6%) reported having been exposed to ADHD training at university. Furthermore, of these students, 66.7% reported receiving information about ADHD, and 33.3% received both information and skill development training. All in-service teachers felt they would benefit from additional training. This desire was also shared by the majority of the broader sample of teachers, with 94.4% of the total sample reporting they would benefit from additional ADHD training. More specifically, the aspects of training they desired the most information on were

assessment/diagnosis (81.7%), classroom management strategies (84.5%) and cause and treatment (74.6%). Lastly, only 19 (26.8%), out of the total sample, thought they had ‘the necessary knowledge and skills’ (perceived knowledge and skills) to manage a child with ADHD in the classroom.

Pre-Service Teachers

Similarly to in-service teachers, only a small minority ($n = 7$, 33.3%) of pre-service teachers indicated having prior exposure to ADHD training at university. Of these students, five reported receiving information about ADHD training, only one received skill development and one received both information and skill development training. Additionally, of the seven, all felt they would benefit from additional training and this was also shared by the broader sample of pre-service teachers. It also appeared, for the majority of pre-service teachers, the aspects of training they desired the most information about were information about classroom management strategies (100%), treatment (90.5%), assessment/diagnosis (85.7%), and prognosis (81%). Similarly to in-service teachers, only a few ($n = 3$) pre-service teachers perceived they had the ‘the necessary knowledge and skills’ to manage a child with ADHD in the classroom.

Parents

Interestingly of the total parent sample ($n = 67$), 53.7% of parents indicated they would benefit from additional training, and the aspects of training they desired the most information about were treatment (53.7%) and causes (52.2%). Furthermore, the small sub-sample of parents with a child with ADHD, although very small, also felt they would benefit from additional training.

3.3.4 Discussion

In conclusion the aims of Study One were to examine teachers’ ADHD knowledge and attitudes toward children with ADHD in the classroom. Furthermore, study one evaluated

the behavioural strategies teachers use in the classroom management of children with ADHD. Pre-service teachers' ADHD knowledge and attitudes toward children with ADHD were also examined. In comparison, parents' knowledge about, and/or experiences of, having a child with ADHD in school were explored. The key findings of Study One are summarised under the following headings.

In-Service and Pre-Service Teachers' Knowledge

There were no significant differences found in teachers' knowledge of ADHD whether they were currently working with an ADHD child or not; or whether they were experienced teachers or teacher trainees. In comparison to previous Australian research, which examined teachers' overall ADHD knowledge, the current findings are comparable to Kos et al. (2004) who reported an average knowledge score of 60.7% and West et al. (2005) who reported an overall correct response of 56%. Bekle's (2004) and Ohan et al.'s (2008) findings were substantially higher than the aforementioned Australian studies, with an overall correct response rate of 83% and 76.34%, respectively. However, these results should be viewed with caution. In this study, due to what was in hindsight, the unfortunate wording of the question, it was implied that teachers who have worked with children with ADHD in the past (but are not currently) are more similar to those who have *never* taught a child with ADHD than to those who are currently doing so. The results for teachers not working with a child with ADHD are likely to have been inflated by the inclusion of those who had worked with children with ADHD in the past but who were not currently working with children with ADHD.

When compared to research in New Zealand and North American, the teachers in the current study fared better in their overall knowledge than some North American teachers (47.8%, Scitutto et al., 2000), however, were not as knowledgeable as the teachers in other studies conducted in North America (77.5%, Barbaresi & Olsen, 1998; 77%, 78%, Jerome et

al., 1994; 70%, Vereb & DiPerna, 2004) and New Zealand (76%, Curtis et al., 2006). Kos et al. (2004; 2006) asserts the reasons for the differences in the proportion of higher correct responses between studies may be associated with the different methodologies used by each study. For example, the use of different measures including the differences in content covered, response options used, and the content of each item used to assess ADHD knowledge between the studies, may have seemingly magnified teachers' lack of knowledge given the progressively lower scores with increased numbers of items reported across these studies (Kos et al., 2004; 2006).

A significant relationship was found between ADHD knowledge and perceived knowledge and skills for pre-service teachers. However, there was no significant relationship found between these variables for the remaining in-service groups. These findings are at odds with the literature (Kos et al., 2004).

Pre-Service Teachers' Knowledge and University Training

There were no significant differences in scores for those reporting previous ADHD training at university and those without. These findings are consistent with Bekle's (2004) findings. Unfortunately, in the current study pre-service teachers were not asked to indicate the intensity or nature of the training to which they were exposed. Therefore, these results need to be viewed with caution. The failure to find a difference between those with training and those without may be attributed to the broad nature of the training question and the implicit inference that all training is equivalent.

Parents' Knowledge

As mentioned previously, no formal analyses were conducted on the responses of parents with a child with ADHD due to the low sample size. In trying to understand and remediate this low sample size, the Learning and Attentional Disorders Society of Western Australia and a Western Australian ADHD parent support group were contacted. They

suggested several possible explanations. Firstly, the length of the questionnaire, although piloted on a small sample of parents without a child with ADHD, may have been too time-consuming for the additional time-constraints placed on parents with a child with ADHD in trying to attend to their child's needs. Secondly, it is also possible that parents have been inundated with requests to participate in ADHD research, with little to nothing in return for their efforts made. Perhaps if parents were offered some support post participation, rather than "one-off" deals with little to no follow-up or additional support services, then their eagerness to participate in such research may increase. Thirdly, it is possible that some parents may not have understood all the information provided or the questions asked in the instrument.

While the sample size for parents with a child with ADHD was disappointing, the sample of parents without a child with ADHD was positive and given, to date, that no research has considered the views of these parents, these current results are of considerable interest in understanding the context in which children with ADHD attend school. Parents were able to correctly answer 40.4% of the knowledge items and 58.1% of the items on the causes subscale. However, less than half of parents were informed about characteristics and treatment, with scores on each of these subscales as low as 42.9% and 34.3%, respectively. This is consistent with previous findings, highlighting that parents of children with ADHD are most knowledgeable about causes than characteristics and treatment of ADHD. Interestingly, of the items most commonly answered by parents (see Table 3.8), five items (32, 64, 56, 44, and 61) mirrored the findings of West et al.'s (2005) research, highlighting that parents were more informed about items relating to the characteristics of ADHD than treatment. Parents were found to hold common myths or perceptions about the treatment of the condition. Although these findings were consistent with research by West et al. (2005) who assessed parents of children with ADHD, the current reported knowledge base is much

lower. This is of relevance given that the knowledge and perceptions of these parents are likely to have a bearing on the experiences children with ADHD in the school community.

In-Service and Pre-Service Teachers' Attitude

There was no relationship found between knowledge and attitudes for the three teaching groups. However, exploratory analyses revealed some interesting findings. An examination of the similarities and differences between individual items on the 30-item Attitude Scale showed that generally all groups held comparable views regarding ADHD. Specifically, all samples of teachers generally held a positive perception toward the condition, considering the condition as a valid diagnosis and a legitimate educational problem. These findings accord with the self-report data results by Kos (2004) when comparing both in-service and pre-service teachers. Pre-service teachers also appeared less confident when reflecting on their skills and abilities in managing children with ADHD than did in-service teachers. These findings, taken together, suggest that the pre-service cohort is less confident in their abilities to manage children with ADHD, which is a comforting finding, because over-confidence would have been of more concern, given these teachers are still undergoing training.

Behavioural Intentions and Strategies

There was a significant relationship between scores on the Knowledge Scale and teachers' intentions to use appropriate classroom organisation and curriculum strategies and appropriate instructional strategies. Exploratory analyses also revealed that of the six strategies examined, teachers working with an ADHD child ($n = 16$) shared more unfavourable views towards negative consequences. These findings mirror Kos (2004) findings which also inferred that teachers prefer to apply positive management techniques to manage children's behaviour in the classroom. However, it is concerning that teachers perceive negative consequences in a more unfavourable manner as these strategies have been

shown to be an important part of behavioural-based training programs for children with ADHD both in the classroom and at home. Perhaps teachers lack the confidence necessary to implement such strategies effectively. There is a fine line between using these strategies effectively or ineffectively, or rather, overuse or misuse of these strategies. This is certainly an area that warrants further investigation.

A Comparison of Teachers' and Parents' Knowledge

Descriptive analyses revealed that both teachers and parents tended to be more knowledgeable about ADHD characteristics than ADHD treatment. Overall, it appears there are some similarities and differences in the facts 'known' and 'not known' by teachers and parents. As noted previously, the restrictiveness of the measurements used to compare these groups constrained any further analyses and, therefore, it is unknown whether there would have been any significant differences for these groups between knowledge items. However, these are still very interesting preliminary findings that should be followed up because (i) parents and teachers may be working from different understandings about ADHD, and (ii) they may have complementary knowledge sets that could benefit the other if they work together.

Study One has provided additional justification for the need for training of pre-service and in-service teachers and for the importance of establishing consistency in the attitudes, knowledge and behaviours of teachers, and with parents knowledge when responding to each child with ADHD. Moreover, those parents without a child with ADHD in the school community may also benefit from education to correct misperceptions about the nature of children with ADHD.

3.3.5 Limitations

As with all studies, this study had several limitations. The sample size of both the comparison groups of teachers and parents, as well as, the geographic homogeneity of the

total sample, may have implications for the ability to generalize these findings. In addition, the sample was overwhelmingly female (84.5%); however, this perhaps reflects the high proportion of their representation among Australian teachers in general (Bekle, 2004; Kos, 2004). Similar to Bekle's (2004) study, the limitation in the questionnaire design meant it was unable to account for the type of training (brief or intensive) received by teachers.

The instruments chosen to measure the domains of interest in this study also limited the interpretation of findings. Firstly, the different teachers' and parents' Knowledge Scales made comparison between the groups difficult. As discussed in Chapter One, the measures for teachers were based on the Kos (2004) measure, designed to assess teachers' knowledge, attitudes and behaviours toward children with ADHD. While parts of this measure were adapted for parents, the Knowledge Scale was not. As mentioned previously, there is scarcity in the availability and use of attitudinal scales for both teachers and parents. To date, the Kos (2004) Attitude Scale is the only measure to separate teachers' knowledge and attitudes; therefore, this measure was chosen to assess teachers' attitudes. Given the questionnaire designed by Kos (2004) was designed specifically for teachers, internal validity of the scale has not been assessed for use with parents and cannot be assumed given the different characteristics of the groups. Thus, when assessing parents' attitudes, therefore, the KADD-Q was selected for parents, because it considered parents' knowledge and myths or misperceptions. Although the KADD-Q, as purported by West et al. (2004), offers an instrument specifically designed to assess (and compare) teachers' and parents' knowledge of ADHD and misperceptions, the instrument was selected to assess parents' knowledge and beliefs because sampling had already begun for teachers and the instrument chosen for teachers was not relevant for parents. Given that both the Kos (2004) Knowledge Scale and the West et al. (2005) Knowledge Scale was based on Scitutto et al.'s (2000) Knowledge Scale, it was assumed that there would be comparable items. Upon investigation, this proved

to be difficult, as there were only eight items of variable degree of similarity. Future studies should consider more directly comparable questionnaires for teachers and parents.

Additionally, further exploration into how the authors of the measures, used in this study, selected the areas to focus on in designing their questionnaires would be beneficial as it appears they seem to have a different sense of the key issues in managing children with ADHD. Therefore, it could be concluded that even researchers have these differences of opinion when they are in possession of all of the facts about ADHD, which highlights how difficult it must be to develop a shared understanding between parents and teachers when they rarely have access to the depth of information available to researchers. The development of the scales used in this area of research is a critical issue in developing a comparable literature.

Secondly, while the true-false format of the KADD-Q for parents allows for the differentiation of lack of information (“don’t know” responses) from the common misperceptions about ADHD (“incorrect responses”), it merely confounds knowledge and myths in order to attain a total knowledge score. While West et al. (2005) suggests the instrument is measuring myths or misperceptions; no distinction is made between knowledge and myths. However, it is important to highlight that both scales allow for the differentiation of knowledge and misperceptions when items are analysed individually. There is also ambiguity in that the answers to the KADD-Q are a little too dichotic.

The self-report nature of all instruments is another limitation. When using self-report measures, despite the benefits of anonymity it is difficult to determine whether participants respond truthfully or whether social desirability might affect the way participants answer items.

While this study was unable to assess parents’ perceptions separately, such a group warrants further investigation, in order to ascertain the extent to which parents perceptions

impact on behavioural intentions and their own self-reported experience in raising a child with ADHD.

Given the scope of a DPsych project and the range of significant gaps in the current literature on ADHD, a choice had to be made at several junctures as to whether to aim for breadth of coverage of these gaps (e.g., parents without a child with ADHD, experienced teachers, pre-service teachers, attitudes, beliefs and intervention) or depth of analysis in one area of investigation. On the whole we erred on the side of breadth but feel that a reasonable balance was achieved. Obviously, either choice necessarily comes with constraints to other aspects of potential investigation. In this instance, the depth of some of the statistical analyses is an obvious need for future research coverage that went beyond the scope of what could be addressed here. Particularly the more careful analyses of incorrect knowledge versus ‘don’t know’ responses to questionnaire items would significantly add to our understanding of the nature of required interventions: either correcting misperceptions (and associated existing practices/behaviours) or targeting the addition of new knowledge in a more preventative approach to teacher and parent training. Each goal requires a different style of intervention and may be expected to have different outcomes. Larger sample sizes would also facilitate the ability to undertake these more fine grained analyses in future studies.

Overall, irrespective of the limitations, the present study highlighted that teachers and parents directly and indirectly involved with children with ADHD have some knowledge of ADHD. For all groups, this knowledge was somewhat stronger in relation to characteristics when compared to their knowledge of effective treatment. While there are some commonalities and some points of difference between what is ‘known’ by each group, there is an openness and willingness in all parties to learn more and to acknowledge the limitations in their knowledge.

Behavioural practice amongst teachers is not related to their level of ADHD knowledge and reflects a commitment to positive strategies albeit in the context of a lack of information about negative consequence options.

Parents of children with ADHD have significant concerns about their child's experience at school and recognise the strong influence of particular teachers in this experience. The pleading of one mother "don't give up on them" captures, both the tenacity of parents in persisting in the care of their children, and also, their wish for teachers to look beyond the disorder and connect with the child.

In sum, this study provides new information on teachers' and parents' knowledge of ADHD as well as their attitudes toward the disorder, both of which are likely to impact on the treatment programs applied and the success of treatment. The inclusion of parents without a child with ADHD was informative in illuminating a potentially strong determinant of school culture and social culture for children with ADHD. The relevance of intervention and assistance for teachers and parents was highlighted and the importance of collaboration between the two in fully understanding the child with ADHD was well established. The quantitative and qualitative information gleaned from all groups of participants will now provide the evidence-base and platform for the design and evaluation of a pre-service teacher intervention program in Study Two.

CHAPTER 4: STUDY TWO

4.1 Overview

Study One showed that teachers and pre-service teachers identify an awareness of limitations in their knowledge of, attitudes and skills relating to children with ADHD. A preventative approach to classroom management would suggest that training pre-service teachers would be helpful in preparing them for the demands of the classroom.

While pre-service teachers may be the key to improving the conditions of the regular classroom environment for children with ADHD, no studies have investigated training possibilities for pre-service teachers'. Before examining the program presented for pre-service teachers in the current study, this chapter will review the few ADHD programs published for in-service teachers. The rationale and hypotheses for the current study will then be outlined.

4.2 *ADHD Teacher Training Programs*

Only three published ADHD training programs have been evaluated for in-service teachers (Barbaresi & Olsen, 1998; Jones & Chronis-Tuscano, 2008; Syed & Hussein, 2009). The first in-service training program was conducted in North America by Barbaresi and Olsen (1998) who recruited 44 regular education teachers from a single school (mean age 42 years) to attend a two and a half hour program presented by a paediatrician. The intervention was developed by the national organisation Children and Adults with Attention Deficit Disorder (CHADD) involving: instruction-focused training about ADHD; reflective discussions about ADHD classroom management strategies; and a question time to complete the in-service program. Participants were assessed at pre- and post-intervention in relation to teachers' training and knowledge about ADHD, teacher stress, and teacher-related student behaviour. Results from the study showed that at pre-test, 41% of the teachers thought that 'ADHD could be caused by poor parenting', 41% 'by sugar or food additives'; while 64%

thought that ‘methylphenidate should be used only as a last resort’. After intervention, fewer teachers maintained these beliefs (7%, 5%, and 34%, respectively). The main findings revealed a reported increase in knowledge and a decrease in stress at post-test. However, the study had its limitations. The authors highlighted that the study lacked a control group, and the sample used was small and recruited from a single school. The absence of an instrument to measure the use of behavioural strategies in the classroom pre- and post-intervention was also noted. In their defence, beliefs or attitudes are generally stable constructs and so the absence of a control group is not as damaging as it might be in a study seeking to impact on acute or fluid participant characteristics (Tabachnick & Fidell, 2001).

Jones and Chronis-Tuscano (2008) examined the efficacy of a brief in-service ADHD training program with a group of 142 in-service teachers (mean age 37.12 years) from six elementary schools in the Washington, DC metropolitan area. Participants were randomly assigned to either the immediate in-service training group or the waitlist control group (who received the in-service training one month later). Seventy-four teachers participated in a brief in-service intervention. The intervention provided teachers with an overview of ADHD (including issues in identification and diagnosis), information on empirically supported treatments and classroom behaviour management strategies, combined with interactive exercises and handouts. The 68 teachers in the control group received the in-service training following their last data collection point. Measures used in the study were designed by the authors and assessed ADHD knowledge and use of behaviour modification techniques. Data were collected at pre- and one month post-intervention for both intervention and waitlist control groups.

Results showed a statistically significant change across time for the intervention groups, but this was only a very small, one point increase in ADHD knowledge in relation to the waitlist group. The authors speculated that this result may be reflective of the high

knowledge mean score at pre-intervention for both the in-service intervention group ($M = 19.5$) and waitlist control group ($M = 18.9$). There were no notable changes in reported use of behavioural techniques following the intervention; however, special education teachers reported increased use of behaviour modification techniques post intervention. However, as noted by the authors, the measure was primarily developed for the purpose of the study and was limited due to lack of item analysis and test construction. The length of the brief in-service intervention, although not formally published in the literature, was said to be limiting, described as a “one-shot deal” with no follow-up measures.

The most recent ADHD program, piloted in Pakistan by Syed and Hussein (2009), measured the success of a two hour per day, week long program (five working days) in increasing teachers' ADHD knowledge across three schools in various areas of Karachi. Forty-nine participants attended this interactive program which included video-clips, participant handouts and other material. The intervention program included: Days (1-2) provided information on normal development and psycho-educational issues about ADHD, comorbidity, differential diagnosis, and medication. Days (3-5) focused on familiarising participants with psychometric tools, behavioural techniques, as well as case scenario exercises and interactive discussions. The authors were the primary facilitators with the addition of a clinical psychologist who attended and facilitated the classroom management skills section, employing a multi-component intervention model (e.g., behaviour modification tools). Teachers were assessed pre- and post-program, and on six-month follow-up occasions using an adapted version of the Jerome et al. (1994) scale. Outcome measures showed an increase in knowledge post-workshop, this difference being consistent with the six months follow-up. In contrast to most researchers, the authors did not discuss the limitations of their study. Mention was made of the restrictiveness of the findings in determining whether such an increase in ADHD knowledge leads to a subsequent increase in referrals of ADHD

children to mental health services/professionals. In response, a longitudinal study was recommended to assess the impact of such a program on the pattern of teacher referral for ADHD. It is safe to conclude that the generalisability of these findings is limited, given the lack of control group (though see earlier comments on this) and the small sample size.

Consistent with most studies to date, there was also an absence of any instrument to measure the use of behavioural strategies in the classroom across time.

Although research examining the efficacy of teacher ADHD training programs is scarce (Barbarese & Olsen, 1998; Jones & Chronis-Tuscano, 2008), the programs reviewed add preliminary support for the use of such interventions in improving teacher ADHD knowledge and, in some cases, positively altering attitudes towards students with ADHD.

No programs for pre-service teachers have been published, but a few studies have investigated the impact of training on pre-service teachers' attitudes about individuals with special needs more broadly. These programs provided some guidance in the development of the current intervention program.

4.3 Pre-Service Special Needs Education

Teachers' attitudes towards children with special needs can determine the success or failure of their education in the regular classroom (Alghazo, Dodeen, & Algaryouti, 2003). Studies have indicated that when teachers adopt certain positive values regarding children with special needs and their socio-cultural environment, inclusive education is more successful. Appropriate teacher preparation and in-service education for them has been shown to positively influence educators' attitudes toward children with disabilities or special needs (Avramidis & Norwich, 2002; Bussing, Gary, Leon, Garaven, & Reid, 2002; Campbell, Gilmore & Cuskelly, 2003; Loreman, Forlin, & Sharma, 2007; Sharma, Forlin, Loreman, 2008; Sharma, Loreman, Forlin, & Earle, 2006; Subban & Sharma, 2006). In such education programs, teachers are exposed to information about special needs via a

unit/course/subject or an alternative approach, known as content infusion, involving the systematic introduction of knowledge about special needs children through the teaching course (Kowalski, 1995). In general such training has been found to lead to more accurate knowledge and a positive effect on pre-service teachers' attitudes towards inclusion of children with disabilities (Campbell et al., 2003; Carroll, Forlin, & Jobling, 2003; Forlin, 2003; Sharma et al., 2008). To illustrate: a study conducted by Campbell et al. (2003) evaluated a group of pre-service teachers' knowledge of and attitudes toward Down Syndrome, and attitudes toward disability in general. This study assessed teachers' attitudes both before and after they participated in one-semester unit on Human Development and Education comprising both formal instruction as well as structured fieldwork experiences. The primary aim of the study was to establish whether raising awareness of a disability (e.g. Down Syndrome) through the application of the aforementioned training methods could increase the knowledge of the condition and the attitudes of individuals toward the disability. Results of the study supported the use of disability training courses. After completion of the unit students had a greater knowledge of Down Syndrome and an improved attitude toward the disability (e.g., students held less stereotypical views towards children with Down Syndrome). This positive improvement was not limited to Down Syndrome but extended to disability in general. There was a positive change with respect to pre-service teachers' expectations of children with special needs, including those with Down Syndrome, with regards to learning potential within mainstream classrooms (Campbell et al., 2003). Other significant attitudinal changes included a significantly greater coping and less discomfort, uncertainty, fear and vulnerability when interacting with people with disabilities (Campbell et al., 2003). However, interestingly, it was also found that students reported less "sympathy" for people with disabilities, which according to the authors may reflect "a more desirable, relaxed approach to disability" (Campbell et al., 2003, p.376). As discussed by the authors,

the results must be interpreted with caution. Firstly, respondents' affirmation of positive attitudes towards inclusive education for children with Down Syndrome, and disability in general, may have been influenced by their bias toward socially desirable views (Campbell et al., 2003). Secondly, direct causes attributing to attitudinal change over the semester cannot be inferred conclusively from the one group pre-test post-test design (Campbell et al., 2003). Finally, although it was demonstrated that attitudinal change toward one disability may inadvertently lead to changes in attitudes towards disabilities generally, as stated by the authors, it is difficult to determine whether these attitudes will be maintained once students enter the classroom and are faced with the difficulties that arise when managing children with behavioural and learning disabilities. Additionally, a follow-up measure would have been helpful in evaluating the results.

In sum, Study One in the current project reinforced the need for a training program for an Australian sample of teachers and pre-service teachers. Further, as reviewed, the research literature highlights (i) the effectiveness of ADHD training for in-service teachers, and (ii) that university information-based courses can lead to changes in both knowledge of and attitudes towards disability in general, thereby supporting the case for the development of training programs on ADHD for pre-service teachers.

The aims of the present study were:

- 1) To further investigate pre-service teachers' knowledge of and attitudes toward children with ADHD, in order to inform the development of an ADHD intervention program for pre-service teachers, and
- 2) To conduct an evaluation of a pilot ADHD program for pre-service teachers, specifically, measuring changes in ADHD knowledge, perceived knowledge and skills, and attitudes based on participant report from pre- and post-intervention and follow-up.

For each goal, specific hypotheses were tested:

Part One: Knowledge and Attitudes

Hypothesis 1a: Pre-service teachers' perceived competence will be correlated with knowledge of ADHD.

Hypothesis 1b: Pre-service teachers who report having received training at university about ADHD will be significantly more knowledgeable than pre-service teachers who report not having received training about ADHD.

Hypothesis 1c: Pre-service teachers who report having received no training at university will have significantly more unfavourable attitudes about children with ADHD than pre-service teachers with ADHD training

Part Two: Intervention Effectiveness

Hypothesis 2a: Pre-service teachers who participated in the intervention will report greater perceived knowledge and skills at post-test than at pre-test and will maintain their perceived knowledge and skills at follow-up.

Hypothesis 2b: Pre-service teachers who participated in the intervention will show an increase in their ADHD knowledge at post-test over their pre-test knowledge and will maintain this learning at follow-up.

Hypothesis 2c: Pre-service teachers who participated in the intervention will show more favourable attitudes toward children with ADHD at post-test over their pre-test beliefs and will maintain their positive attitudes at follow-up.

CHAPTER 5: STUDY TWO: PART ONE: METHOD

5.1 Overview

Permission was secured from Murdoch University Human Research Ethics Committee and the Murdoch Education Faculty to use their students as participants in my study. I then approached the Co-ordinator of the Special Needs unit within the Faculty of Education at Murdoch University to seek approval to collect data from those enrolled in the unit. I chose the Special Needs unit because it is the primary unit that exposes pre-service teachers to information about children with challenging behaviours, more specifically, children with disabilities. The content covered in the Special Needs unit focuses on inclusion and inclusive education practice. The primary aims of the unit are to assist students in developing: (a) an understanding of many of the significant issues and public policies surrounding the education of students with special needs in the Australian context; (b) an increased awareness of the notions of difference and disability; (c) knowledge and skills in identifying, assessing and planning for diverse learners; (d) an understanding of particular disabilities/ and or special needs, and the possible impacts on development; and (e) a sound base of generic information about practices (particularly teaching and learning adjustments) which support the inclusion of students with disabilities and/or special needs in education settings.

No unit within the Faculty of Education at Murdoch University specifically focuses on ADHD but the Special Needs unit is mandatory in order to graduate with a Bachelor of Education. The school experience practicum that students complete during the course of this unit requires that they undertake a supervised two-week block of school-based teaching experience. Students must successfully complete this preliminary component in order to continue with the next level of school experience.

The unit coordinator of the Special Needs unit agreed to: (1) My attending two tutorial groups allocated for students enrolled in the Special Needs unit and distributing a questionnaire in order to assess their knowledge of and attitudes toward children with ADHD; and (2) presenting a three-hour ADHD intervention program (equivalent to the time allocated for a lecture and tutorial) to pre-service teachers as part of the Special Needs unit before they were to be placed on their two-week block of school experience.

To accord with ethical standards, participation in the study was kept separate from any assessment of course work, and students were assured by the unit coordinator and I that the measures used in the study would not be graded or have any influence on their unit or course marks. Their anonymity was assured by the use of a coding system that allowed all questionnaires to be non-identifying.

5.2 Part One: Method

5.2.1 *Participants*

Seventy-seven pre-service teachers from Murdoch University Perth, Australia who were completing a Bachelor's Degree in Education participated in this study. Demographic characteristics of participating pre-service teachers are presented in Table 5.1. Students were enrolled in either their 3rd or final year of the degree and were studying either early childhood, primary or secondary teacher education. While 77 pre-service teachers participated in this study, there were some missing data and therefore an *n* value is provided throughout to alert the reader of any change in participant numbers.

5.2.2 *Instrumentation*

Pre-service teachers were asked to complete the Self-Report ADHD Questionnaire for Pre-Service Teachers (see Appendix D). The questionnaire was identical to that developed and used for an earlier pilot sample of pre-service teachers, apart from the inclusion of a sub-

question to question 5 which asked participants to also indicate whether they would be going on practicum (school experience) in four weeks. Unfortunately due to semester-related dictates on the timing of these consecutive studies, analyses from Study One were incomplete by the time of re-implementation of the questionnaire for Study Two. Subsequent analyses illuminated changes that would have been desirable in the questionnaire before re-implementation. One example is the non-discriminating nature of the item relating to previous training on ADHD. Implication of these limitations will be further outlined in the Discussion.

Table 5.1

Pre-Service Teacher Descriptive Characteristics for Total Sample (n = 77)

Age (in years), <i>M</i> (SD)	27.87 (8.55)
Sex, % Female	85.7
Currently on Practicum, %	
Yes	16.9
No	83.1
Type of Practicum, %	
Primary	71.4
Secondary	6.5
ADHD University Training, %	
Yes, information and skill development	28.6
None	71.4
Would Benefit from Additional Training, %	
Yes	93.5
No	5.2
Aspects of ADHD Required, %	
Assessment/diagnosis	93.5
Classroom management strategies	94.8
Preferred Method of ADHD Training, % yes	
Workshop	44.2

Note: *M*: mean; *SD*: standard deviation.

5.2.3 Procedure

Pre-test data were collected three weeks prior to the implementation of the workshop. During the 13 week semester, students are required to attend a one hour lecture and a two hour tutorial per week. I attended the last 30 minutes of a tutorial period, providing students with a brief overview of the research and confidentiality procedures. As per Study One, pre-service teachers were given the same cover page and consent form detailing the purpose of

the study (see Appendix O and P, respectively). I then instructed participants to place their completed questionnaires into the box provided at the front of the room. I was not present while the questionnaire was completed and only returned at the conclusion of the lecture to collect the box. The questionnaire took approximately 15 to 20 minutes to complete.

5.3 Part One: Results

5.3.1 *Data Analysis*

All data were analysed using the Statistical Package for Social Sciences, version 15. Copies of all analyses for Study Two are provided in Electronic Appendix (C). Firstly, the preliminary analysis of psychometric properties will be discussed followed by hypotheses testing. As per study One, I have combined incorrect answers with 'don't know' responses to form a 'not known' category as a counterpoint to the 'known' (correct responses) category.

5.3.2 *Preliminary Analysis of Psychometric Properties*

Internal consistencies of the measures used in this study were estimated using Cronbach's alpha. The results obtained suggested the Self-Report ADHD Questionnaire for Pre-Service Teachers is an internally consistent measure of pre-service teachers' knowledge about ADHD and their attitudes toward children with ADHD ($\alpha = .74$, $\alpha = .67$, respectively). As discussed in Study One, alpha coefficients of slightly less than Nunnally's (1978) standard of 0.70 were considered acceptable in light of the non-singular nature of the attitudes and knowledge being measures in each scale. In such circumstances, lower internal consistency is to be expected (Moss et.al, 1998)

The 30 items of the ADHD Attitude Scale were subjected to principal components analysis (PCA) to assess the robustness of the scale (Pallant, 2007). Both the sample size and the ratio of subjects to items were lower than is desirable for PCA when the purpose is generalisation of results. However, the specific purpose of conducting the analysis in this

instance was to see how the questionnaire worked with this particular sample and to utilise the resultant factor structures for further discrimination of analyses for this sample (Osborne & Costello, 2004).

The PCA initially revealed the presence of eight factors with a criterion level of eigen values greater than 1, which explained a total of 70.8% of the variance in the items (see Electronic Appendix D for the pattern of factor loadings). In examining the pattern matrix established in the PCA, it was found that one item (39) did not correlate with any of the variables and three items (63, 64, 42) did not load highly on one particular factor (i.e., have a loading of less than .3). As such these items were deleted from further analysis. A reliability analysis was conducted to test the internal consistency of each factor derived from the PCA. As a result, factor 8 was deleted from any further analysis as it did not meet the criteria for being a reliable scale.

In total, seven factors with an eigen value of greater than 1.00 were extracted. The total variance explained by the factors was 66.8% (See Table 5.2 for the pattern of factor loadings $>.3$). Factor 1 was named *Negative Classroom Effects* (4 items, accounting for 20.6% of the variance) because the items reflected a belief that children with ADHD have a negative effect on the classroom environment, where children were seen as a disruption and a frustration to teaching.

Factor 2 was named *Perceived Competence* (3 items, accounting for 11.3% of the variance) because the items measured teachers' belief that they have the skills and ability to manage students with ADHD.

Factor 3 was named *Lack of Respondent's Personal Control* (3 items, 9.4% of the variance) because the items assessed the perception that, respondents have control (or not) over the management of children with ADHD.

Factor 4 was named *Optimism* (3 items, accounting for 8.3% of the variance) because the items indicated respondents' positive perception of managing children with ADHD.

Factor 5 was named *ADHD Child's Lack of Control* (4 items, accounting for 6.5% of the variance) because the items assessed a perception by respondents that children with ADHD have very little control over their own behaviour and often misbehave.

Factor 6 was named *Diagnostic Legitimacy* (4 items, accounting for 5.9%) because the items indicated respondents' view ADHD as an invalid diagnosis.

Finally, Factor 7 was named *Expectations* (3 items, accounting for 4.6% of the variance) because the items assessed negative expectations about children with ADHD.

Four factors (*Negative Classroom Effects, Perceived Competence, Diagnostic Legitimacy, and Expectations*) loaded similar items to those factor loadings reported by Kos (2004). The scores on the seven factors were then averaged to form composite factor scores. These scores were used for all subsequent analyses. These factor groupings were conceptually sound, mapping on to key issues highlighted in the literature.

In contrast to Kos (2004), I again abandoned the use of an analogue scale and instead participants were asked to rate their belief about each item on a 5-point Likert-type format (e.g., "Strongly Disagree" to "Strongly Agree"). Although Kos developed 31 items, one item was inadvertently omitted from her study and, as a result of the principal components analysis, 6 items were removed. Therefore, only 24 attitude items were assessed.

Table 5.2

Factor Loadings in the Oblique Seven-Factor Solution

Item	Factor						
	1	2	3	4	5	6	7
43	.843						
44	.655						
51	.634						
50	.605						
61		.944					
60		.914					
62*		-.455					
40			.700				
47*			-.600				
46			.443				
45				.813			
48				.750			
59				.677			
56					-.883		
57					-.796		
53					-.645		
54					-.439		
38						.781	
41						.771	
36*						-.576	
37						.541	
55							.849
49							.585
52							.401

Note: Factor loadings <.3 are not displayed. * reverse scored item

5.3.3 Hypotheses Testing

The current study set out to investigate pre-service teachers' knowledge of and attitudes toward children with ADHD, in order to inform the development of an ADHD intervention program for pre-service teachers.

5.3.4 Demographic Data

Demographic data are described in Table 5.1. Descriptive analysis of responses showed that no teacher knew all ADHD facts presented (highest score 23/27), the mean being 52% correct. Only 5 of 77 participants thought they had 'the necessary knowledge and skills' to manage a child with ADHD in the classroom. Of the 77 participants sampled, only 22 reported having been exposed to ADHD training at university. Furthermore, of these respondents, 50% reported receiving training about information on ADHD, 9.1% had received skill development, and 40.9% had received both information and skill development training. Additionally, of the 22 participants who reported having been exposed to ADHD training at university, 90.9% felt they would benefit from additional training. This desire was also shared by the majority of the broader sample of pre-service teachers with 93.5% of the total sample reporting they would benefit from additional ADHD training. More specifically, the aspects of training they desired further information on were assessment/diagnosis (93.5%) and classroom management strategies (94.8%).

Hypothesis 1a

A two-tailed Pearson product-moment correlation was conducted to examine the relationship between perceived competence and ADHD knowledge. The outcome of the correlation showed there was a significant, moderate correlation between a perceived competence factor on the Attitude Scale and scores on the Knowledge Scale ($r = .30$, $n = 76$, $p = .008$). Hypothesis 1a was supported.

Hypothesis 1b

An independent-samples t-test was performed on the sum of scores from the 27-item Knowledge Scale to determine whether those pre-service teachers who reported having received training at university differed in their knowledge from those without such training. There was no significant difference in knowledge for those reporting previous ADHD training at university and those without ($t(75) = -.83, p = .407$). Hypothesis 1b was not supported.

Hypothesis 1c

An independent-samples t-test was conducted to compare pre-service teachers' attitudes on each of the seven factors for respondents who had previous ADHD university training and those without. There was no significant difference in scores between respondent groups measuring unfavourable attitudes (e.g., *Negative Classroom Effects*, *Lack of Respondent's Personal Control*, *ADHD Child's Lack of Control*, *Diagnostic Legitimacy* and *Expectations*) of those that reported receiving ADHD training at university and those without. However, there was a significant difference in scores for respondents who had exposure to ADHD training at university on Factor 2 (*Perceived Competence*) ($M = 2.62, SD = .87$) and those without such training ($M = 2.22, SD = .76$); $t(74) = -2.0, p = .05$ (two-tailed) when measuring attitudes. A significant difference between scores for respondents with ADHD training was also found for Factor 4 (*Optimism*) ($M = 2.64, SD = .42$) when compared to those without such training ($M = 2.31, SD = .51$); $t(75) = -2.68, p = .009$ (two-tailed) (see Table 5.3). Although a significant difference was found for factors two and four, the composition of these factors related to pre-service teachers' *Perceived Competence* and level of *Optimism* about teaching children with ADHD. Therefore, hypothesis 1c is not supported, as there was no significant difference found for those without such training on the items loaded on factors

relating more specifically to unfavourable attitudes. There was also a trend toward more unfavourable attitudes amongst respondents reporting no prior training.

Table 5.3

Descriptive Statistics for Significant Factors

Factors	Uni ADHD Training	N	Mean	SD
(1) <i>Negative Classroom Effects</i>	No	55	2.73	.83
	Yes	22	2.81	.62
(2) <i>Perceived Competence</i> *	No	54	2.22	.75
	Yes	22	2.62	.87
(3) <i>Lack of Respondent's Personal Control</i>	No	55	2.58	.63
	Yes	22	2.38	.50
(4) <i>Optimism</i> *	No	55	2.30	.51
	Yes	22	2.64	.42
(5) <i>ADHD Child's Lack of Control</i>	No	54	2.25	.71
	Yes	22	2.16	.62
(6) <i>Diagnostic Legitimacy</i>	No	55	3.09	.71
	Yes	22	2.94	.52
(7) <i>Expectations</i>	No	54	2.08	.63
	Yes	22	2.10	.60

Note: Asterisk denotes statistical significant difference.

5.4 Discussion

This Study investigated pre-service teachers' knowledge of and attitudes toward children with ADHD, in order to inform the development of an ADHD intervention program for pre-service teachers. The key findings supported these aims and are described below.

Pre-Service Teachers' ADHD Knowledge

Reassuringly, pre-service teachers who believed they were more competent also scored higher on the Knowledge Scale.

Lack of ADHD University Training and Actual ADHD Knowledge:

The results replicate those in Study One with no significant difference in scores for those with previous ADHD training at university and those without. As a result, the same inferences can be made as discussed previously in Study One, namely that irrespective of whether a pre-service teacher had prior exposure to ADHD training at university or not, this was not related to their ADHD knowledge. These findings are consistent with Bekle's (2004) findings. However, an important consideration here is that correspondence with the special needs unit coordinator (personal communication, 2008) indicated that students are only exposed to the ADHD topic briefly (in passing) as part of their overall teacher training. Therefore, it could be assumed that of the 22 (28%) students who indicated they had received training, for the majority of them, this training was only briefly covered (e.g., content infusion) throughout their current teaching degree. It is also possible that others received the same brief exposure but didn't consider it to be worthy of reporting as training. However, as explained in Study One, these results need to be viewed with caution. It was unfortunate that the timing of these studies did not allow for review and refinement of this item on the questionnaire before being used in this second study.

Lack of ADHD University Training and Unfavourable Attitudes

There was no significant difference in scores for respondents when measuring attitudes between those with and without ADHD training at university. Pre-service teachers with exposure to ADHD training at university were more likely to have a greater positive perception of managing children with ADHD than those without such exposure. However, as discussed above, these results need to be viewed with caution.

5. 5 Limitations:

The capacity for generalising these findings is constrained by the small sample size, its non-random nature and gender disparity (though it reflects the situation in schools). As

mentioned in Study One, the research design was unable to distinguish the type of training received by respondents (brief or intensive). Yet, as found in Study One the results of part one of this study highlight pre-service teachers' desire for more ADHD training focusing on assessment and diagnosis, and classroom management strategies. Despite this, there are no published programs to date that have evaluated the effectiveness of an ADHD program for pre-service teachers. Given the desire of pre-service teachers to engage in ADHD training and the pressing need for the empirical study of feasible pre-service training programs, part two of the study was developed.

Overall, a relationship was found between perceived competence and ADHD knowledge. While it is concerning that training does not necessarily lead to better knowledge, it is reassuring that teachers do seem to have some insight into the limitations of their knowledge. As concluded in Study One, over-confidence would have been a more concerning finding. Descriptive analyses also showed a strong desire by pre-service teachers to engage in further ADHD training irrespective of whether they had previous exposure to ADHD training or not. In response to these findings, a pre-service teacher intervention program was developed to improve knowledge, attitudes and self-confidence in teachers in responding to ADHD.

CHAPTER 6: STUDY TWO: PART TWO METHOD

6.1 Overview

This part of the study was designed to evaluate an ADHD intervention for pre-service teachers. The intervention was developed in response to the data gathered in Part One.

6.2 Part Two: Method

6.2.1 *Participants*

Of the 77 students who participated in Part One of the survey, 45 attended the intervention program (mean age of 28.69 years, $SD = 8.96$) three weeks after completing the initial questionnaire. However, given 17 participants withdrew from the study before the post and follow-up measures were collected, only the 28 participants who attended the three testing periods (pre, post and follow-up) will be evaluated in this study (See Table 6.2 for descriptive analyses of participating pre-service teachers). There were 28 participants across the three sessions, but some missing data. Pre-service teachers who withdrew from the study were compared to those who remained participants in the study on several teacher characteristics, using independent samples t-tests (e.g., age, gender, ADHD university training, perceived knowledge and skills and actual knowledge). There were no significant differences found. Personal correspondence with the unit coordinator and students revealed that, reasons for withdrawal from the program may be attributed to the student's upcoming exams and pressure from other units and assignment deadlines.

6.2.2 *Instrumentation*

The pre-service teachers were asked to complete the Self-Report ADHD Questionnaire for Pre-Service Teachers (see Appendix D). With the exception of two minor question changes and the addition of the workshop evaluation questionnaire, the measure was the same as that used in Part One of the study. More specifically, the post intervention questionnaire was identical to the pre-intervention measure with the exception of; (1) the

exclusion of question six which reads “What has your University education covered in relation to ADHD?” due to pre-service teachers still undergoing formal university training; (2) the modification of question five to read “Have you just completed two weeks of school experience? If yes, please indicate whether you were placed at a primary or secondary school”; and (3) the exclusion of section D. This was the Professional Development section to be replaced with the ADHD Workshop Evaluation Form measuring teachers’ beliefs about the usefulness of and satisfaction with the workshop (see Appendix R). A two-week follow-up assessment was conducted, applying the same approach used in the pre- and post-measures, apart from the exclusion of the workshop evaluation section.

6.2.3 Intervention Program

The pilot ADHD Intervention Program used in the present study was based on the ADHD program developed by Kos (2004), the literature and the outcomes obtained from the measures in Part One. In Study One students had indicated the areas of ADHD about which they required further information and this information was used to further develop the program to suit the needs of the pre-service cohort. Further, misconceptions held by parents informed the development of relevant material to support effective collaboration between parents and teachers. A description of the Kos ADHD workshop is discussed below, followed by an outline of the current pilot ADHD intervention program for pre-service teachers.

Kos (2004) ADHD Workshop

Kos’ original ADHD workshop was designed for in-service teachers to increase teachers’ ADHD knowledge and, in turn, dispel misperceptions about the disorder. The workshop also aimed to inform teachers about, and encourage them to use correctly, five empirically validated strategies to manage the behaviour of students with ADHD (e.g., positive reinforcement, negative consequences, planned ignoring, organising the classroom and emotional support). Nine in-service teachers (ages 23-49) attended the workshop.

At pre-test, teachers completed a questionnaire similar to the pre-test measure with the exception of a reduced version of the attitude items, Section C, of Kos (2004) ADHD Questionnaire (See Appendix A). Kos (2004) randomly selected a subset (14 items) of the original attitude item scale (31 items) because of time constraints. The post-test and follow-up questionnaires were identical to the pre-test, apart from the addition of a page assessing the usefulness of, and satisfaction with the workshop, and a behaviour management record form at follow-up.

The Kos (2004) ADHD Workshop was conducted over a three-hour session and was held after school at a pre-organised location. Participants received a manual outlining the content of the workshop which included a copy of the overhead transparencies presented during the workshop (see Electronic Appendix D). Presenters were also provided with a training manual outlining the steps required to present the program (see Electronic Appendix D). Kos (2004a) provided teachers with a copy of each of the 40 overhead transparencies, detailing an overview of the nature of ADHD, prevalence, history, causes, assessment, treatments (e.g., biological, psychological and alternative), prognosis and a review of some of the most empirically supported classroom management strategies. The workshop also involved two interactive activities requiring participants to: (1) review three vignettes and tick which of the validated classroom management strategies they would employ in their classroom, followed by an interactive discussion with group members; and (2) a role play activity. Even though the role play activity was designed to be included in the workshop, Kos (2004) excluded the activity due to time constraints. Her results showed that both perceived knowledge and actual knowledge significantly increased from pre-test to post-test, and from pre-test to follow-up; and there was no change between post-test and follow-up ($n = 9$). Important limitations of the study included the absence of a control group and the small sample size used.

Despite this, the program was able to show that, whilst both perceived and actual knowledge significantly increased following attendance at the workshop, there was no further learning or processing of information between post-test and follow-up. Attitudes regarding ADHD remained relatively constant across the three testing periods, with the exception of three attitudes which were shown to change substantially over time. Kos (2004) found that, at pre-test, teachers strongly believed their class would be disrupted if a student with ADHD was present (item 49). However, at post-test the strength of this belief declined to a neutral level and this was maintained at follow-up. Item 44 which read, "ADHD is diagnosed too often" showed a bi-modal distribution across time-points, indicating that at pre-test teachers held a strong belief that ADHD is diagnosed too often; at post-test they held a more neutral belief toward this item; but at follow-up they again strongly held this belief. Further, whilst teachers had neutral beliefs about students with ADHD being just as difficult to manage in the classroom as any student (item 65), at both pre-test and post-test, they disagreed with this item at follow-up (see Appendix A).

The overall effectiveness of the workshop was evaluated and showed that teachers were highly satisfied with the content, time, location and general presentation of the workshop. It was also found that teachers reported an increase in self-confidence in teaching students with ADHD. Finally, teachers reported using a number of the behaviour management strategies covered in the workshop three months after their attendance.

Given the program's success in increasing participants' ADHD knowledge and slight favourable changes in attitudes, this lends further evidence toward the value of training programs to build awareness of ADHD, and in changing attitudes towards it. The present study was therefore designed to investigate the effectiveness of a redeveloped version of the Kos (2004) in-service ADHD workshop in educating pre-service teachers about the condition.

Pilot ADHD Intervention Program

In the current study the program was delivered during a scheduled three hour lecture/tutorial as part of the Special Needs unit for pre-service teachers. The program contained four modules (see Table 6.1 for a description of the program content), each concentrating on different areas of ADHD. The modules chosen have been supported by the research on effective in-service ADHD training programs for teachers (Barbaresi & Olsen, 1998; Jones & Chronis-Tuscano, 2008; Kos, 2004; Syed & Hussein, 2009). The program employed a variety of media involving didactic instruction, a video, and interactive discussions of case scenarios and self-reflective methods to enhance pre-service teacher engagement and learning.

Pre-service teachers participated in a three-hour workshop during which they learned evidence-based information about ADHD and its treatments; and the beneficial effects of employing empirically supported behavioural and classroom management strategies (Chronis, Jones, & Raggi, 2006; Fabiano et al., 2009). Two modules: *Individual Treatment Plans* (Module 3) and *Teacher and Parent Collaboration* (Module 4) were added in addition to Kos' (2004) original program to highlight the importance of developing child-specific treatment plans, as well as, the process of developing these target outcomes which requires the careful input from parents, children, teachers and other school personnel where available and appropriate. The program aimed to employ a multi-modal model, encouraging collaboration with parents with and without a child with ADHD, as well as, adopting a whole-of-school approach.

The program was facilitated using a manual which provided suggested dialogue to facilitate standardised implementation and quality assures. The program began with a welcome followed by the establishment of group rules and a review of the content of the program. An icebreaker was also introduced to assist the promotion of a relaxed atmosphere

for the group. Facilitators then followed the manual, only discontinuing if participants asked a question or if they needed further clarification about the content. A comparison of Kos (2004) and Murray (2009) ADHD program content is presented in Table 6.1.

Table 6.1

A Comparison of Murray's (2009) and Kos' (2004) ADHD Program Content

Module	Murray (2009)	Kos (2004)
	<i>Introduction:</i> overview, learning objectives, setting group rules, program rationale.	Overview of program and registration.
	<i>Exercise 1:</i> Icebreaker	
1	<i>Understanding ADHD:</i> definitions, history, ADHD characteristics, the role of executive functions in ADHD, diagnosis, co-morbidity, prevalence, causes, assessment methods, treatments, and prognosis.	<i>What is ADHD?</i> Definitions, prevalence, history, cause, assessment. <i>Activity:</i> Vignettes and discussion
	<i>Exercise 2:</i> Brainstorming exercise	
2	<i>Classroom Management:</i> <i>Exercise 3:</i> Video and discussion Proactive (e.g., multisensory techniques, attention and active techniques, instructional techniques and classroom organisation techniques) and Reactive (e.g., behavioural intentions, positive and negative consequences) strategies.	<i>Classroom Management:</i> <i>Activity:</i> Brainstorming exercise Classroom management strategies (e.g., classroom organisation, positive consequences, negative consequences, token economy and planned ignoring).
3	<i>Individual Treatment Plans:</i> Goals/desk charts, daily/weekly report cards, student contracts, token economy systems and response cost methods.	
4	<i>Teacher and Parent Collaboration:</i> collaboration with parents and other professionals and team meetings. <i>Exercise 4:</i> Case Scenario Task and discussion. All responses from the case scenario exercise were collated and presented to students as part of an additional booklet to their manuals. Facilitators also reviewed all group responses and made further suggestions if necessary.	

6.2.4 Procedure

Prior to beginning the program participants were presented with a participant manual which included a copy of the outline of the program, presentation slides and additional

resources (e.g., useful references, classroom activity worksheets, research booklets and ADHD support group contacts in Australia) (see Appendix S). Facilitators were also provided with a comprehensive program administration guide, detailing the sequence of events necessary and suggested dialogue to implement the program efficiently and effectively without compromising the program's integrity (see Appendix T).

The program was conducted across three groups. Groups one and two were conducted at the Murdoch University main campus in Western Australia; and the third group (Group 3) was conducted at a remote campus.

The three program facilitators who conducted the intervention program were the Special Needs unit coordinators and me. The Special Needs unit is team-taught by two Education Specialists. Specialist one held a PhD specialising in inclusive education, and specialist two worked as a School Psychologist. Group 1 was facilitated by me and co-facilitated by Education Specialist Two, and Group 2 was facilitated by Educational Specialist One. Group 3 was facilitated by me and co-facilitated by Educational Specialist One. I primarily ran Groups 1 and 3, and the co-facilitator assisted with the setting up of materials, handing out of manuals and assessing compliance with the program's content, as detailed in the facilitator manual. Tests of between presenter effects revealed overall there was no main effect for the presenter ($p = .70$). I discussed and reviewed the program with each Educational Specialist prior to conducting the intervention program. Finally the co-facilitators were asked to read and follow the material and sequence of events outlined in the facilitator manual to assure the pilot intervention program was followed.

Three weeks prior to the ADHD intervention program, *Pre-test measures* were collected. Respondents were coded to ensure anonymity and to minimise social desirability bias.

Post-test measures were collected at completion of the intervention. *Follow-up measures* were collected two weeks later. As mentioned previously, a two-week follow-up timeframe was chosen because pre-service teachers were required to complete a two week practical placement and, for a majority, this placement was to begin immediately following the intervention. In contrast to Kos (2004) who also assessed teachers' reported use of the behavioural strategies covered in the workshop at follow-up, the current researcher omitted this part due to time constraints.

6.3 Part Two: Results

6.3.1 Hypotheses Testing

Part Two of the current investigation was designed to evaluate the effectiveness of a pilot pre-service teachers' ADHD intervention. In order to establish whether pre-service teachers were able to increase their knowledge and alter their unfavourable beliefs toward children with ADHD through a workshop format, three hypotheses were formulated (2a, 2b, and 2c).

The program was administered across three groups, two of which were run concurrently. It was necessary to divide students into groups as one group was located on a remote campus, while the last two groups attended the main campus and were already assigned into two tutorial groups. Participants were tested at two-week follow-up, because it was expected that pre-service teachers would return from their two week practicum and concepts learnt in the program would have been helpful prior to such a practicum.

6.3.2 Demographic Data

In line with Part One of the study, 28.6% (8) reported receiving some ADHD training at university. Overall, the desire for further ADHD training was strong for the whole sample. More specifically, the aspects of training on which they desired the most information were

assessment/diagnosis (93.5%) and classroom management strategies (94.8%). See Table 6.2 for an outline of descriptive analyses.

Table 6.2

Pre-Service Teacher Descriptive Characteristics for Intervention Group (n = 28)

Age (in years), <i>M</i> (SD)	30.18 (10.07)
Sex, % Female	78.6
Currently on Practicum, %	
Yes	7.1
No	92.9
Type of Practicum, %	
Primary	78.6
Secondary	7.1
ADHD University Training, %	
Yes, information and skill development	28.6
None	71.4
Would Benefit from Additional Training, %	
Yes	96.4
No	3.6
Aspects of ADHD Required, %	
Assessment/diagnosis	92.9
Classroom management strategies	96.4
Preferred Method of ADHD Training, % yes	
Workshop	50

Note: *M*: mean; *SD*: Standard deviation.

Hypothesis 2a

To assess whether the differences in perceived knowledge and skills across the three testing times were statistically significant, a one-way repeated measures ANOVA was conducted. The analysis was based on 27 respondents due to one respondent not responding to the perceived knowledge and skills item. The means and standard deviations are presented in Table 6.3. Perceived knowledge and skills scores were compared at Time 1 (prior to the intervention), Time 2 (following the intervention) and Time 3 (two-week follow-up). There was a significant effect for time, $F(2, 52) = 11.90, p = .000$. Bonferroni tests showed that there were significant differences in perceived knowledge and skills between pre-test and post-test ($p = .000$) and between pre-test and follow-up ($p = .000$) but no significant difference between post-test and follow-up.

Hypothesis 2a was supported. Pre-service teachers' reported significantly greater perceived knowledge and skills at post-test than at pre-test. At follow-up, pre-service teachers who participated in the intervention maintained their perceived knowledge and skills at post-test when assessed at follow-up, with no significant differences between scores for those time periods.

Table 6.3

Pre-Service Teachers' Perceived Knowledge and Skills and ADHD Knowledge Scores Across Time for Intervention Group

Measurement time	Perceived knowledge			Actual knowledge		
	N	Mean (0-2)	SD	N	Mean (0-27)	SD
Pre-test	27	.26	.53	28	12.96	4.68
Post-test	27	1.44	.51	28	19.50	2.36
2-week follow-up	27	1.37	.49	28	18.54	3.27

Hypothesis 2b

A one way repeated measures ANOVA was also performed to assess whether the differences in ADHD knowledge across the three testing times were statistically significant. Again there was a significant effect for time, $F(2, 54) = 32.25, p = .000$. Means and standard deviations are presented in Table 6.3. Bonferroni tests showed there to be significant differences between pre-test and post-test ($p = .000$), and between pre-test and follow-up ($p = .000$), but no significant difference between post-test and follow-up.

Hypothesis 2b was supported. Pre-service teachers who participated in the intervention showed an increase in their ADHD knowledge scores than at post-test and this was maintained at follow-up.

Hypothesis 2c

Seven repeated ANOVA analyses were conducted to assess whether teachers' attitudes toward any of the seven factors on the ADHD attitude scale differed significantly over the three testing periods. The analysis was based on 27 respondents for factors

1 (*Negative Classroom Effects*), 3 (*Lack of Respondent's Personal Control*), 4 (*Optimism*), 6 (*Diagnostic Legitimacy*), and 7 (*Expectations*) and 26 respondents for factors 2 (*Perceived Competence*) and 5 (*ADHD Child's Lack of Control*) due to not all respondents responding to the attitude items loaded on these factors. The means and standard deviations are presented in Table 6.4. Of the seven analyses conducted, only Factor 2 (*Perceived Competence*) was found to differ significantly across the testing periods. A more stringent alpha criterion ($p < .01$) was used, given the number of ANOVA measures and increased risk of Type 1 error. Mauchly's test indicated that the assumption of sphericity had been violated (chi-square = 8.04, $p < .05$), therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity (epsilon = 0.78). The results show there was a significant effect for time, with Factor 2 (*Perceived Competence*), $F(1.56, 38.92) = 10.13, p < .05$. Bonferroni tests showed there were significant differences between pre-test and post-test ($p = .007$), and between pre-test and follow-up ($p = .005$), but no significant difference between post-test and follow-up for attitudes. Further examination of the means showed that Factor 1 (*Negative Classroom Effects*), Factor 4 (*Optimism*), Factor 5 (*ADHD Child's Lack of Control*), and Factor 6 (*Diagnostic Legitimacy*) were in the direction of the hypothesis (see Table 7). It is important to note that Factors 4 (*Optimism*) ($p = .06$) and 5 (*ADHD Child's Lack of Control*) ($p = .09$) showed trends in the expected direction. Factors 3 (*Lack of Respondent's Personal Control*) and 7 (*Expectations*) remained fairly consistent across the three time points. Hypothesis 2c is only partially supported because, although there was a significant improvement with *Perceived Competence* (Factor 2) over time, not all attitudes changed significantly across time.

Table 6.4

Pre-Service Teachers' Factor Scores Over Time for Intervention Group

Factor	Measurement Time								
	Pre			Post			F/up		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
1	27	2.91	.71	27	2.76	.76	27	2.77	.75
2*	26	2.41	.95	26	3.19	.56	26	3.22	.83
3	27	2.54	.64	27	2.58	.56	27	2.55	.60
4	27	2.34	.50	27	2.38	.42	27	2.54	.48
5	26	2.31	.69	26	2.05	.65	26	2.07	.60
6	27	3.0	.61	27	2.79	.62	27	2.82	.55
7	27	2.14	.73	27	2.29	.94	27	2.01	.57

Note: Asterisk denotes statistical significant difference.

6.4 Workshop Evaluation

6.4.1 Quantitative Responses

Teachers were asked to complete a number of workshop evaluation questions to assess their satisfaction with it. Both quantitative and qualitative items were used. The quantitative items used to evaluate the workshop are presented in Table 6.5. A higher mean score (i.e., closer to 5) indicates strong agreement with the item; whereas a lower mean score (i.e., close to 1) indicates a general disagreement with the item, except item 4 which was reversed as a check against random responding. Overall, at post-test, pre-service teachers reported that the ADHD intervention was helpful ($M = 4.64$, $SD = .48$) and relevant to their course of study ($M = 4.60$, $SD = .49$). Table 6.5 also shows that teachers were highly satisfied with the presentation of the material, expressing an increased knowledge of ADHD and self-confidence in teaching students with the disorder.

Table 6.5

Mean (and Standard Deviation) Satisfaction Ratings at Post-Test (n = 28)

Item	Description	Mean	SD
1	The workshop was helpful in providing you with information about ADHD	4.64	.49
2	The information was clearly presented	4.57	.50
3	The workshop material provided was adequate fulfilling the objectives of the training	4.43	.63
4	The case scenario exercise was not useful	2.11	1.17
5	The workshop has increased my confidence in teaching children with ADHD in the classroom	4.32	.61
6	The workshop presented was relevant to your course of study	4.61	.50

6.4.2 *Qualitative Responses*

Teachers were also asked to comment on four items qualitatively. For a description of each item and respondents' verbatim responses, see Table 6.6. Overall, pre-service teachers reported satisfaction with attendance at the workshop, particularly with regard to the workshop being helpful in providing them with information about ADHD and practical management strategies. Some suggestions were made regarding desired changes to the workshop, including increasing the workshop duration and the time spent on practical exercises.

Table 6.6

Qualitative Workshop Evaluation Items and Verbatim Responses of Pre-Service Teachers Collected at Post-Test

Items and Responses	
1	<p>Were there any topics NOT covered that you would have liked to see included? If yes, what would you suggest?</p> <p>Working with parents of children with ADHD General information about ADHD Information on nutrition More examples of students misbehaving and management strategies Handling adolescents with ADHD Other disorders similar to ADHD Applied Behaviour Analysis and other strategies ADD/Autism</p>
2	<p>What was the best aspect of the workshop?</p> <p>Practical ideas, suggestions given and video Opportunity to have discussions with other students and presenter Techniques out into practise Case studies Classroom techniques and behaviour management strategies shown Slides in the booklet References Subject/content was interesting and easily understood Take home manual/resource book The summary of the case scenario answers Presenter was excellent, very clear and well presented.</p>
3	<p>Would you change any aspect of this workshop? If yes, what would you suggest?</p> <p>Make a whole day training Addition of a role play Make it longer More time for delivery, more time for the case scenario exercise Information on nutrition</p>
4	<p>Do you have any other recommendations for improving the workshop? If yes, what would you suggest?</p> <p>Learnt a lot and now feel I am better able to manage a student with ADHD in the classroom Longer time/ information overload More time - whole day or series of days</p>

6.5 Discussion:

Based on the preceding discussion of the results, several conclusions were drawn from this study. First, in order to determine the efficacy of the pre-service training program, pre-service teachers' knowledge and attitudes were measured over time. It was hypothesised that pre-service teachers who participated in the intervention would show an increase in ADHD knowledge and perceived knowledge and skills. Given this, one can conclude that by

simply attending a 3 hour ADHD workshop significantly improved teachers' knowledge about the disorder, and that this learning was maintained two weeks later.

It was further hypothesised that pre-service teachers would report more favourable beliefs toward children with ADHD in the classroom. Consistent with our expectations, teachers' perceived competence in their skills and ability to manage students with ADHD increased over the three testing periods. Furthermore, examination of the means of other factors on the ADHD Attitude scale showed that there were other factors that had changed in the direction predicted, although these differences were not found to be significant. Two factors, *Optimism* and an *ADHD child's lack of control*, are of particular interest, given they were found to be marginally significant. *Optimism* indicated respondents' positive perception of managing children with ADHD; this was shown to increase over the three testing periods, providing some tentative support for the hypothesis that pre-service teachers would show more favourable beliefs toward children with ADHD subsequent to a targeted educational intervention. Even more encouraging, respondents' perception that children with ADHD have very little control over their own behaviour and often misbehave was shown to reduce at post-test and follow-up, thereby promoting a more positive attitude toward these children.

The study also asserted that pre-service teachers were highly satisfied with the workshop, believing it to be helpful and relevant to their course of study. An overwhelming number of attendees reported an increased knowledge of ADHD and self-confidence in teaching students with ADHD.

Lastly, building from the previous point, it was concluded that the provision and inclusion of a three-hour program involving didactic instruction and practical exercises for pre-service teachers undertaking a Bachelor of Education degree increases knowledge and favourable attitudes, and also increases pre-service students' teaching confidence. These

finding are consistent with other studies (Barbaresi & Olsen, 1998; Jones & Chronis-Tuscano, 2008).

6.6 Limitations:

Although great measures were taken to ensure a strong study, there were still a number of limitations. Frequently cited limitations for clinicians who provide and evaluate the efficacy of intervention programs have been the maintenance of such gains, or generalisation, of these findings over time (Barbaresi & Olsen, 1998; Jones & Chronis-Tuscano, 2008). Due to the nature of this research, it was not feasible to extend the time period allocated for this study in order to determine whether the knowledge and information pre-service teachers obtain during the workshop will be retained over a lengthier period.

Similarly, pragmatic constraints in incorporating a control group mean that it is not possible to rule out the possibility that these positive findings may have resulted for pre-service teachers even without their participation in the intervention. Though again, it is noted that this is a less constraining issue when stable characteristics such as beliefs or attitudes and knowledge are, being targeted rather than dynamic characteristics (Tabachnick & Fidell, 2001). A study with a longer lead time (such as a PhD) may be more capable of extending the study for a further semester to engage new cohorts as controls.

Selection bias may have also limited the generalisability of these findings. As previously noted, withdrawal can be attributed to pre-service students' upcoming exams and pressure from other units and assignment deadlines, therefore, it is reasonable to hypothesise that the participants who remained were better able to cope with stressors or manage workloads potentially influencing the external validity of these results.

Overall, the workshop for pre-service teachers was found to be an enabler for teachers to understand and work effectively with children with ADHD. Furthermore, this workshop shows promise as a cost-effective and time-limited means of educating pre-service teachers

about this disorder. Given there are no published programs for pre-service teachers evaluating the effectiveness of educational ADHD programs, these findings have important implications for curriculum development within pre-service teacher education. Workshops, such as the one implemented in this study, should be considered as an adjunct to education courses and in-service teacher professional development programs, equipping teachers with the necessary knowledge and skills before entering the workplace.

CHAPTER 7: CONCLUSIONS

7.1 Overview

These studies set out to extend existing literature in the area of ADHD in the classroom. Two separate studies were conducted. Study One provided additional justification for the need for consistency among in-service teachers', pre-service teachers' and parents' knowledge of and attitudes toward children with ADHD. Further, while it appeared teachers across the groups held comparable views, it was highlighted that pre-service teachers generally perceived themselves as less confident in their skills and abilities to manage children with ADHD. Parents with a child with ADHD spoke passionately about their concerns for their child and about their wish for close, collaboration and co-operation with teachers. Moreover, this study included parents without a child with ADHD in recognition of the importance these parents play in influencing the broader school environment for children with ADHD. Consistent with previous research involving parents with a child with ADHD, parents without a child with ADHD were found to be more informed about items relating to the characteristics of ADHD than treatment and were more inclined to hold common myths or perceptions about the treatment of the condition. Comparisons between parents and in-service teachers showed that while there were some similarities and differences between the two groups, differences in the measures used to evaluate these groups restricted the analyses and interpretation somewhat. Descriptive comparisons between teachers and parents suggested that there were some similarities and some differences in what was 'known' and what myths were held by the two groups. Perhaps most importantly, these parents held views that were potentially more critical of parents with a child with ADHD than those views held by teachers. This highlights the potential for these parents without a child with ADHD to be a significant negative influence on the schoolyard culture toward children with ADHD. While this study was not without limitations, the findings add to the existing literature highlighting

the need for tertiary institutions to provide appropriate training to teachers. Education was also noted as a priority for parents, in order to maximise the care provided by teacher and parents and to facilitate the development of a collaborative stance between teachers and parents in the school community.

Study two was in two parts. A relationship was found between perceived competence (a factor on the Attitude Scale) and scores on the Knowledge Scale. While these findings in part replicate those found in study one measuring a related construct, perceived knowledge and skills, it appears there is a need for further research focused on investigating the accuracy of this hypothesis. Pre-service teachers genuinely had some insight into the limitations of their expertise when managing a child with ADHD in the classroom, and also showed a strong desire to engage in further ADHD training. This evidence base about gaps in their knowledge was then used in part two of Study Two to develop and evaluate a three hour pilot ADHD intervention program. The intervention was found to be effective in improving pre-service teachers' ADHD knowledge and perceived knowledge and skills to manage students with ADHD across time.

Taken as a whole, these studies suggest that that while teachers are somewhat informed, there is a need for further training in order to better equip teachers, pre-service teachers and parents with the knowledge and skills necessary to maximise the success and positive experiences of children with ADHD in the school environment. Moreover, each group may have a complementary knowledge and skill set that could combine to provide the most effective systemic multimodal approach to intervention.

There were a number of methodological limitations present in both Study One and Study Two. Primarily, it was highlighted that the modest sample size, restrictiveness of the measures and the lack of control group were of concern but a necessary constraint of the timeframe of a Professional Doctorate enrolment and the attempt at a developmental program

of research. Given that the limitations of the current studies have been commented upon in each section and are also found in the handful of other studies in this area, implications of the current results for future research will now be discussed.

7.2 Directions For Future Research

A number of opportunities for future research are evident on the design and results of this study.

Study One:

It is recommended that future research extend the sample base and the geographic location by which it is derived. As mentioned previously, a primary limitation of the current study were the measures chosen. Thus, future research should use a measure for parents and teachers that are directly comparable and also apply more rigorous validity and reliability testing methods to increase the internal consistency of these measures. In this way the empirical evidence concerning the use of these measures will be substantially expanded.

The sample size for parents with a child with ADHD was very low. It is recommended that if future researchers face this problem, qualitative methods, such as focus groups, be applied in order to capitalise on communication between parents. Such communication can then generate more robust conclusions from the parents. This method allows facilitators to encourage participation from parents in an open and respectful environment. In addition, this method may also be effectively applied to the in-service sample, in order to maximise the opportunity to speak with teachers in a time effective manner, which also prevents them from having to engage in a more mundane task, such as completing a questionnaire, which can be less attractive.

As expected, we found the knowledge scores of parents' without a child with ADHD knowledge scores were much lower than previous studies focused on parents with a child with ADHD. The knowledge and perceptions of these parents are likely to have an important

bearing on the experiences children with ADHD face within the school community and, therefore, further investigation is warranted for this group.

Future studies may also benefit from exploring more closely the nature of what is ‘not known’ by teachers and parents. We know from attitudinal studies that it is easier to develop favourable attitudes where there has been uncertainty or an acknowledged lack of knowledge than where a false belief has been held. Those items indicated as ‘don’t know’ by respondents may be the ones easiest to change rather than those responses that were incorrect indicating a falsely held belief. These latter types of ‘mis-knowledge’ may require more than the provision of corrective information, they may also require evidence that counters their currently held belief.

Teachers’ behavioural intentions and strategies used in the classroom were poorly investigated in this study due to the low sample size of teachers currently working with children with ADHD. Future research should investigate the reasons why teachers prefer to apply positive management techniques to manage children’s behaviour in the classroom, in order to understand whether there is a knowledge-base deficit or whether teachers’ attitudes towards such strategies reflect their behaviours.

Study Two:

This present study developed and implemented a new pilot ADHD intervention program with promising outcomes. In particular the application of the pilot program was shown to improve pre-service teachers’ knowledge and attitudes. This study provides the necessary groundwork on which future studies can build to further refine and improve ADHD programs for teachers. These programs can then be made available to teachers with the aim of enhancing the experience of children with ADHD in the classroom.

In order to improve upon the findings of the current research, the following recommendations are made:

The degree to which pre-service teachers' maintained their knowledge and information derived from the pilot intervention is unknown. It is recommended that future research establish a feasible means of determining whether these gains are able to be maintained over time. Furthermore, it will be equally important to determine whether changes in pre-service teachers' knowledge and attitudes result in a more accurate application of management strategies in the classroom, with greater perceived self-confidence in doing so. An added advantage would be the application of observation methods, although these are often avoided because of practical limitations. These will more objectively identify knowledge and skill gaps both at pre- and post -intervention.

Programs like the one implemented in this study should be conducted over a longer time-period. For example, a 13-week program, over a period of an hour per week, is recommended to allow for the transference of knowledge across time and to give students an opportunity to follow-up on what was learnt from week to week. A 13-week time-frame is chosen because most education units are run over a 13 week semester. However, it is possible that extending the duration of this pilot program may also result in a trade-off between the amount of information covered and likely attendance of pre-service teachers.

Future research should also encourage the facilitator of such a program to follow-up with a sample of students, by attending a couple of days of their practicum, to ensure reinforcement and generalization of the skills learned. This would also allow the facilitator to provide feedback to students on an individual basis while, assisting with any challenges they may be experiencing. Perhaps an in-service teacher component for those students on practicum may also be of benefit to reinforce the concepts and skills learnt and to further build on the knowledge and skills of in-service teachers.

The content of the program, although it involved interactive discussions and a case scenario exercise limited the opportunity for transference of the theoretical knowledge and to

practice. The insertion of role play exercises would have been one means of enhancing learning even further, particularly when demonstrating behaviour-based strategies.

It is recommended that such a program should be made compulsory for pre-service teachers, given the prevalence of children with ADHD and the challenges teachers face when managing children with ADHD in the classroom. Furthermore, the value of parents being involved in the training with teachers and perhaps even the importance of the training being more explicitly systemic in its orientation and therefore encouraging pre-service teachers to collaborate with parents for good outcomes is also recommended.

7.3 Summary

The current research adds to the small body of research literature on teacher and pre-service teachers' knowledge of and attitudes toward ADHD, and parents' knowledge of ADHD. While this research certainly had some limitations, the overall findings suggest that there is a strong need for improved knowledge of and change in attitudes towards children with ADHD. These findings are shared with many authors who have investigated the constructs of interest in this study. However, the uniqueness of this research was the inclusion of a group of parents without a child with ADHD and the comparability of these findings to those of parents of children with ADHD. Furthermore, the examination of pre-service teachers' knowledge of and attitudes toward children with ADHD also adds to the scarcity of literature in this area. Perhaps the most significant novel finding is the effectiveness of the pilot ADHD intervention in enhancing pre-service teachers' knowledge and perceived knowledge and skills, and providing a frame for future studies to build upon and further refine and improve ADHD programs for teachers. As summed up by one of the parents of a child with ADHD, we have a responsibility to not "give up on them".

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Appendix A: Kos (2004) Self-Report ADHD Questionnaire

Appendix B: Self-Report ADHD Questionnaire for In-Service Teachers

Appendix C: Questionnaire for In-Service Teachers

Appendix D: Self-Report ADHD Questionnaire for Pre-Service Teachers

Appendix E: Self-Report ADHD Questionnaire for Parents

Appendix F: Knowledge of Attention Deficit Disorders Scale (KADD-Q)

Appendix G: Knowledge of Attention Deficit Disorders Scale Sub-Scales

Appendix H: ADHD Questionnaire for Parents

Appendix I: Questionnaire Evaluation Form

Appendix J: Letter to Principals

Appendix K: In-Service Teacher Information Form

Appendix L: In-Service Teacher Consent Form

Appendix M: Parent Information Form

Appendix N: Parent Consent Form

Appendix O: Pre-Service Teacher Information Form

Appendix P: Pre-Service Teacher Consent Form

Appendix Q: Newspaper Article

Appendix R: ADHD Workshop Evaluation Form

Appendix S: Participant Manual

Appendix T: Facilitator Manual

Electronic Appendix

Reliability of Scales (see separate folder)

Appendix A: Coding Procedures

Appendix B: Study One Analyses

Hypotheses Testing (1a, 1b, 1c, 1d, 1e, 1f and 1g)

Exploratory Analyses

Appendix C: Study Two Analyses

Part One:

Principal Components Analysis

Hypotheses testing (1a, 1b, and 1c)

Part Two:

Hypotheses Testing (2a, 2b, and 2c)

Appendix D: Kos' (2004) ADHD Workshop

Kos' (2004) Participant Manual

Kos' (2004) Facilitator Manual