ADHD in Preschool: Approaches and Teacher Training

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Abstract

Due to the prevalence of ADHD, there is a need for early intervention at the preschool level to improve children's chance of academic success in later years. Yet few preschool teachers are trained to meet the challenges children with ADHD present. This paper gives a rationale and curriculum for teacher training in ADHD, with an emphasis on Social Emotional Learning, Parent Training, and Field Experience with a Mentor.

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The scientific status of attention deficit hyperactivity disorder (ADHD) is one of the most controversial issues in child health (Breggin, 2007; Stein, 2001). Thousands of studies have been conducted on ADHD diagnostic nomenclatures prior to the Diagnostic and Statistical Manual of Mental Disorders Text Revision, (Charach & Lckowicz, 2013; APA, 2000). Despite this long history, ADHD is not necessarily well understood among the lay public, given the many controversies and public misconceptions concerning the disorder (Jenson, 2000). Longitudinal evidence suggests that childhood ADHD persists into young adulthood in 60%-70% of the cases when defined relative to same-age peers and in 58% of the cases when DSM-IV-TR criteria and parental reports are used (Barkley et al., 2002, Keenan et al., 1997, Lavigne et al., 1996). Early studies of childhood hyperactivity excluded many children that would currently meet the DSM-TR criteria for ADHD, particularly the inactive sub-type (McGough et al., 2004).

This paper gives an overview of characteristics of children with ADHD, and discusses the prevalence of ADHD, academic strategies and the challenges children with ADHD present for preschool teachers. A rationale is given for the need for teacher training for those who teach preschool children with ADHD, and specific program of training for preschool teachers is recommended. In addition to coursework focusing on characteristics of ADHD, this program includes a supervised field experience or practicum in which prospective preschool teacher training teachers observe and work directly with children with ADHD (Bricker & Widerstorm, 1996; Rosenkotter & Stayton, 1997; Sandall et al., 2005; Macy, Squires & Barton, 2009; and Shyman, 2012). This preschool teacher training program for ADHD is innovative and supported by research. A discussion of these ideas will conclude the paper.

Overview of ADHD

ADHD is recognized as a common childhood psychiatric disorder (National Institute for Health & Clinical Excellence, 2009) and has a strong genetic, neuro-biologic, and neurochemical basis (Biederman et al., 2009; Schubiner, 2008). It is characterized by symptoms of inattention and/or impulsivity and hyperactivity which can significantly impact many aspects of behavior and performance, both at school and at home (Faraone et al., 2003). ADHD is characterized by pervasive and impairing symptoms of inattention, hyperactivity, and impulsivity according to DSM-IV (APA, 2000, 1994). The World Health Organization (WHO) (ICD-10, 1993) uses different nomenclature hyperkinetic disorder (HD) but lists similar operational criteria for the disorder. Regardless of which name is used, ADHD is one of the most thoroughly researched disorders in medicine (Goldman, 1998).

The DSM-IV-TR diagnostic criteria for ADHD were based on reviews of existing research (McBurnett, 1997) and on a field trial in which alternative diagnostic criteria were evaluated (Lahey, 2004). The DSM-IV-TR defines ADHD as a cluster of symptoms. The patient must have at least six or more out of the 9 symptoms of inattention and/or six or more out of the 9 symptoms of hyperactivity/impulsivity (Ghanizadeh, 2012; Solanto et al., 2012).

According to Ghanizadeh (2012), the proposed revision of ADHD by the American Psychiatric Association added 4 new symptoms to the Hyperactivity and Impulsivity aspect in DSM-V including: "Tends to act without thinking, such as starting tasks without adequate preparation or avoiding reading or listening to instructions, may speak out without considering consequences or make important decisions on the spur of the moment", "Is often impatient, as shown by feeling restless when waiting for others and wanting to move faster than others", "Is uncomfortable doing things slowly and systematically and often rushes through activities or tasks", and "Finds it difficult to resist temptations or opportunities (A child may grab toys off a store shelf or play with dangerous objects)" (DSM-5 development, APA, 2012).

Classification of what constitutes ADHD has changed dramatically over the last 37 years, due to successive revisions of the Diagnostic and Statistical Manual. In addition impairment must be due to symptoms in two or more settings (e.g. home and school) and clear evidence of significant impairment in social, school or work functioning. The DSM IV also allows the classification of two sub-type disorders. The first subtype is predominantly inattentive in which the child only meets criteria for inattention; and second is predominantly hyperactive–impulsive in which only the hyperactive–impulsive criteria are met.

Prevalence of ADHD

The relative prevalence of the disorder is high, affecting approximately 4% of all children, although estimates vary widely from 3% to 11% or more (Zametkin & Ernst 1999). The disorder usually begins in early childhood and is characterized by excessive activity, even when the child's developmental level and limited behavioral control are taken into consideration. (Elia et al., 1999). Szatmari (1992) reviewed the findings of six large epidemiological studies that identified cases of ADHD within these samples. Prevalence rates in these studies ranged from a low of 2% to a high of 6.3%, with most falling within the range of 4.2% to 6.3%. Other studies have found similar prevalence rates in elementary school-age children, 2.5–4% (Pelham, Gnagy, Greenslade, & Milich, 1992); 4–5.5% in (Breton et al., 1999; 5–6% (DuPaul, 1991); and 7.9% (Briggs-Gowan, Horwitz, Schwab-Stone, Leventhal, & Leaf, 2000). Lower rates may result from using complete DSM criteria and parent reports 2–6% (Breton et al., 1999), and higher rates

from using just a cutoff on teacher ratings up to 14.3% (Trites, Dugas, Lynch, & Ferguson, 1979); 15.8% (Nolan, Gadow, & Sprafkin, 2001); and 23% (DuPaul et al., 2006; Power et al., 1998). Sex and age differences in prevalence are routinely found in research studies. For instance, prevalence rates may be 4% in girls and 8% in boys in the preschool age group (Nolan et al., 2001), yet fall to 2–4% in girls and 6–9% in boys during the 6 to 12 year-old age period based on parent reports (Breton et al., 1999; & Szatmari et al., 1989). The prevalence decreases again to 0.9–2% in girls and 1–5.6% in boys by adolescence (Breton et al., 1999; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993; McGee et al., 1990; Romano et al., 2001; Szatmari et al., 1989). Overall ADHD affects 2% to 9% in school age children (Biederman, 2005; Jindal, 2002).

Academic Strategies and Intervention for Young Children with ADHD
An overview of empirically supported academic interventions for students with ADHD is presented. Research now indicates that ADHD exists in pre-school children (Daley et. al., 2009). These children constitute about 3 to 7% of the pre-school-age population in the United States equivalent to approximately one child in every classroom, (Trout et al., 2007), with the number of boys being 2 to 3 times more likely than the number of girls in school-based samples (APA, 2000). As a function of their ADHD symptoms, children with this disorder experience a variety of difficulties in school settings, including difficulties with academic achievement, and peer relationships (Barkely, 2006). One way to address the problem of academic under achievement is to provide effective intervention (Trout et al., 2007). Many young children with ADHD enter kindergarten with below average skills, so academic intervention strategies should be addressed as early as possible (Daley et al., 2010; DePaul & White, 2005). Numerous studies have demonstrated that children with ADHD have poorer grades, higher rates of school failure and repeated grades, and greater rates of academic underachievement compared to same-aged and even IQ-matched peers (Loe, et al., 2008, & Barry, et al., 2002). Bauermeister and colleagues (2007) found that children with ADHD (aged 4) were likely to have educational problems; these individuals were more likely to receive special education, and have a history of suspension or expulsion.

Brock et al., (2009) suggested child-level classroom accommodations for children with ADHD such as limiting task duration, introducing breaks and dividing longer tasks up into smaller parts. Brock also recommended increasing the amount of direct instruction time a child receives (versus independent seat-work) and revising task directions to be short, specific, and direct.

Educational Laws for Children with ADHD
Two federal laws, the Individuals with Disabilities Education Improvement Act (IDEIA) of 2004 and Section 504 of the Rehabilitation Act of 1973 (Weber, 1995), are relevant for the needs of children with ADHD (Wright, 2011). The regulations implementing these laws are 34 CFR sections 300 and 104, respectively, which require school districts to provide free appropriate public education to students who meet their eligibility criteria (NASET, 2005). Eligibility decisions about a child's need for special education and related services are made on a case-by-case basis. School districts may not arbitrarily refuse to either evaluate or offer services to students with ADHD (NASET, 2012). Under IDEA, children with ADHD are eligible for special education services through the other health impairment category (Treesco et al., 2010). Services include accommodations and related services in the general education setting, such as

preferential seating and modified instruction (Reid et al., 1995). These commonly recommended accommodations such as preferential seating have not been studied in terms of effectiveness as yet (Leo et al., 2006).

The Individuals with Disabilities Education Improvement Act (IDEIA) of 2004 states: *"Disability is a natural part of the human experience and in no way diminishes the right of individuals to participate in or contribute to society. Improving educational results for children with disabilities is an essential element of our national policy of ensuring equality of opportunity, full participation, independent living, and economic self-sufficiency for individuals with disabilities* (p. 2648-49)".

Almost 30 years of research and experience have demonstrated that the education of children with disabilities including ADHD can be made more effective by having high expectations for such children and ensuring their access to the general education curriculum in the regular classroom, to the maximum extent (National Research Council, 2010). IDEIA (2004) mandated that educators increase inclusive education for all children in public schools. Inclusive education has developed in three main directions: understanding the practice of inclusion as it relates to different disabilities and difficulties, understanding the factors which help build inclusive schools which can respond to diverse needs and comparing the efficiency of separate special education and inclusive education (Jenkinson, 1997). As defined by the Institute on Disability (2009), "Inclusive education is characterized by presumed competence, authentic membership, full participation, reciprocal social relationships, and learning to meet high standards by all students with disabilities in age-appropriate general education classrooms with supports provided to students and teachers to enable them to be successful (p. 1)".

The ideal inclusive education is a concept in which children with ADHD are viewed as true full-time participants and members of their neighborhood schools and communities (Tan and Cheung, 2006). Children with ADHD educated in general education classrooms demonstrated better performance in reading and math (Cole et al., 2004), and second significantly higher in adaptive behavior when compared with similar educated in separate settings. For inclusion to be successful in schools, collaborative efforts are needed to provide services to all who need them. Teachers can play a vital role in this process and in increasing inclusive opportunities for their students with ADHD.

The Challenge ADHD Presents for Teachers in Preschool Classrooms
Up to 44% of children in special education pre-school classrooms meet the diagnostic criteria for ADHD (Zima et al., 1999). The behaviors of a child with ADHD are the main challenge for both parents and teachers. Yet there is little training specially designed to teach preschool teachers how to work with children with ADHD. If pre-school teachers understand basic behavioral principles and reinforcement, children with ADHD will be more successful in their first school experience and spend more time on task learning (Webster-Stratton et al., 2012). The challenge for pre-school teachers is to learn how to reinforce appropriate behavior skillfully as well as so they can teach social skills to children with ADHD, and teach basic skills to prepare them for school settings.

Teachers also need to be knowledgeable about behavior-psychosocial treatment (BPT) and parent training interventions (PTI). BPT and PTI should be the part of the regular curriculum for children with ADHD and preschool teachers should be trained in their use. BPT is considered a suitable first-level treatment for young children presenting signs of ADHD (Conners et al., 2001), and there is growing evidence of the efficacy of BPT for parents of children with ADHD, especially if delivered in the pre-school years (Daley et al., 2007). The success of BPT for pre-school children is based on the principle that early intervention, before the child's transition to school, and before the child has experienced secondary risk factors (e.g., school failure, peer rejection and the development of an antisocial tendency) offers the best opportunity of changing the developmental course of the disorder (Daley, 2006).

Parent-training interventions (PTI) were designed to assist parents in behavioral and/or cognitive behavioral interventions to improve the management of their child's ADHD-related difficulties (Zwi et al., 2009). Several studies showing positive effects of behavioral parent training and preschool-based behavioral programming (Gleason, 2012; Rajwan et al., 2012; McGoey et al., 2005; Sonuga-Barke et al., 2004; Webster-Stratton et al., 1999). PTI may include group-based interventions, interventions for individual parents, and direct interventions with children (Zwi et al., 2009). PTI has been shown to improve the quality of life for the family by decreasing parental stress (Schreibman, et al., 1996) and increasing leisure and recreation time (Koegel et al., 1982). PTI also can increase parents' optimism about their ability to influence their child's development (Koegel et al., 1982), which may help them sustain their efforts with their child over time. PTI can be cost effective because it requires fewer hours of direct service and also increases children's ability to generalize positive behavior (Ingersoll et al., 2006; Kashinath et al., 2006).

Best Practices in Educating Children with ADHD
Establishing educational practices and procedures that are effective and most promising remains a challenge. Controversy exists in the field of ADHD with a considerable lack of agreement with regard to strategies and methods that are most effective. The question of whether only established evidence-based methodologies should be used or whether programs should also include a discussion of methodologies with less evidence basis remains disputed (Das et al., 2013; Shyman, 2012). Simpson (2008) suggested that "there is a lack of practical information and well-designed guidelines that professionals and families can use to identify the most suitable, effective, and utilitarian methods from among the countless available interventions and treatments" (p. 3).

Rationale for Pre-school Teacher Preparation in ADHD

ADHD influences many children worldwide, particularly young children (Jonsdottir et al, 2005). Kewley (2010) estimated that 3% to 5% of preschool learners are diagnosed with ADHD in classrooms. The most recent report provided by the U.S. Centers for Disease Control (CDC) estimated that nearly 7.8 percent of school-age children demonstrate some type of ADHD (2005). This means that the typical teacher in the United States will have at least one or two students affected by ADHD in their own classrooms (Brown, 2007).

Recent data indicate that many teachers feel unprepared to teach children with ADHD (Bekle, 2004; Bussing et al., 2002; Rush and Harrison, 2008; Walter et al., 2008). The lack of expertise has created a formidable challenge for schools: to better meet the diverse and complex needs of preschool children with ADHD. Although ADHD has become common in schools, the field of pre-service teacher training with a focus on ADHD is in its infancy for elementary teachers and even more so for preschool teachers. Within this context, it is critical that ADHD receive considerable attention in any teacher preparation curriculum and in the college classroom (Rieger, 2009). A number of recent studies has demonstrated that children with ADHD are at high risk for poor academic achievement (Breslau et al., 2009; Currie and Stabile, 2006; Fletcher and Wolfe, 2008; Vitaro et al., 2005). These findings suggest that teachers today need to have a good understanding of the types of instructional and behavior management approaches that effectively promote academic engagement and achievement and achievement in these students (Martinussen et al., 2011).

Jerome et al. (2006) reported that majority of American and Canadian practicing teachers in their study did not receive training in ADHD during their teacher preparation program (i.e., pre-service training). Bekle (2004) also reported that a majority (77%) of her sample of Australian practicing teachers did not receive pre-service training in ADHD. In addition, Bekle found that very few of the practicing teachers had received "comprehensive" in-service training in ADHD during teacher training programs which specialize in ADHD. If standards and accountability measures are to be appropriately applied in the process of improving teacher quality, it is incumbent upon faculties of education to lead the way in defining, measuring and improving the preparation of quality teachers (McArdle, 2010). It is important that professional discourse and scientific research begin to focus on contributing to an evidence-based framework (Hempenstall, 2006) for pre-school and elementary teacher training in ADHD. There is a clear need for such programs based on evidence based practices in order to prepare teachers who are skilled in teaching students with ADHD.

Little attention has been specifically directed toward ADHD classroom interventions (Gureasko-Moore et al., 2007). Classroom teachers want training in intervention approaches that will assist them in effectively working with children with ADHD (Reid et al., 1995). One setting in which this training would be particularly beneficial is in an inclusive learning environment where the majority of students with ADHD are educated (Gureasko-Moore et al., 2007). According to National Association of School Psychologists (2011), there are few intervention components available for children with ADHD. These include the collaboration and consultation with families and skilled parental behavior support at home. Promoting the use of consistent approaches across home and school settings is critical along with monitoring by a school-based intervention team to ensure effective implementation of interventions and to provide adequate support for those interventions. It is important to evaluate the effectiveness of programs in meeting behavioral and academic goals along with collaboration with community agencies. It is also important for professionals to evaluate how well they are providing educational and related services to students/families. Interventions to help students with ADHD that appreciate their unique abilities and help to develop feelings of self-confidence are also important to the progress of children with ADHD.

A lack of research exists in the area of an effective evidence-based framework for pre-school teacher training in ADHD. The Council for Exceptional Children (CEC) supports the perspective that "… the rationale for having different research methodologies in special education is based on the current conceptualization of research in education and the complexity of special education as a field" (Odom, Brantlinger, Gersten, Horner, Thompson, & Harris, 2005, p. 137–148). As such, it is imperative that pre-school teacher training in ADHD beware of the amassed evidence basis (Strong, 2009) for methodologies (Lyytinen, 1987).

Currently, classroom interventions for children with ADHD focus on reducing problematic behavior and increasing task engagement (Tannock, 2007). Many children with ADHD who exhibit problem behavior will require supports and interventions that address both their behavioral and academic difficulties (Metcalfe et al., 2013; Reid et al, 2004). Teachers can employ a range of antecedent and consequence-based approaches to manage student behavior (Reid et al., 2006; and Reid et al., 1998). All teacher preparation programs should ensure that the latest ADHD scientific evidence and the most recent advances in educational intervention are core components of their curriculum (Martinuseen et al., 2006) for pre-school teacher training programs in ADHD.

Conceptual Framework for Pre-school Teacher Training Programs in ADHD

It has been well-established that individuals with ADHD have specific needs that warrant focused training and knowledge. Specific and detailed guidelines are required to create a solid framework for pre-school teacher training programs in ADHD.

As noted, the National Association for the Education of Young Children (NAEYC, 2009) proposed guidelines for developmentally appropriate practices in early childhood programs serving children from birth through Age 8. As defined by NAEYC (2009), these guidelines included creating a caring community of learners, assessing children's development and learning, and establishing reciprocal relationships with families. The National Association for the Education of Young Children (NAEYC) and The National Association of Early Childhood Specialists (NAECS, 2003) proposed an additional standard for teachers: making sound decisions about teaching and learning, identifying significant concerns that may require focused intervention for individual children and also helping preschools to improve educational and developmental interventions in existing programs.

The coursework should focus on an overview of the characteristics of ADHD and methodologies, along with a practicum or field experience (Macy, Squires, & Barton, 2009; Sandall et al., 2005; Rosenkotter & Stayton, 1997; Bricker & Widerstorm, 1996; Ryan et al., 1996). An observation component should be mandated for all students, during which the student observes and/or works directly with multiple individuals (Shyman, 2012) with ADHD, as well as produces written reports on their observations and clinical experiences (Shyman, 2012).

Practicum
Pre-service programs with intensive field components (Lovingfoss et al., 2001; Keefe et al., 2000; Bay & LopezReyna, 1997; Epanchin & Wooley-Brown, 1993) require one or two

practicum experiences, and a semester or year-long student teaching placement. Programs with such extensive field experiences recognize the developmental nature of teaching (Brownell, Ross, Colón, & McCallum, 2005). Macy, Squires and Barton (2009) offer some important features of quality practicum experiences: the philosophy and intervention approaches of a pre-service program should match or at least be congruent with the philosophy and approaches used in a practicum setting, and the required duties in a practicum setting should match the teaching competencies of a pre-service teacher training program in ADHD.

Diverse opportunities should be provided to teachers in training (Rosenkoetter & Stayton, 1997) including staged learning opportunities (Winton, McCollum & Catlett, 1997). Practicum students should be able to generalize instructional strategies for children with ADHD in a variety of contexts and settings. A skilled cooperating teacher should be available in a practicum setting to model instructional strategies and provide opportunities for practicum students to engage in reflective practice with children with ADHD (Schon, 1991). Several studies have demonstrated a functional relation between feedback and the effective practices of teachers (Barton et al., 2007; Codding et al., 2005). Practicum placements should provide competency or standards-based experiences for students, and they should allow for individualization by practicum students to meet individualized career goals for children with ADHD. Dreyer (1998) summarizes this by noting: "When beginning teacher training students spend more of their training time in schools they get the opportunity to integrate theory of education with that which they are experiencing at first hand".

The pre-service teacher applies newly acquired skills and knowledge, such as behavior management principles and activity-based intervention strategies, to promote early development (e.g., using two-or three-word sentences in conversation, remaining at a task for 5 minutes) and to increase children's self-help skills (putting on one's own coat, washing one's hands) (Macy, Squires, & Barton, 2009). Also, student teaching in the preschool environment can accelerate the pre-service student's learning process, allowing for the integration of theoretical and fundamental information from course-work, as well as practicing intervention skills taught in a pre-service student's method classes (Stayton et al., 2003; Miller et al., 2002; Bricker et al., 1996; Ryan et al., 1996). Coursework in teaching preschool children with ADHD should be included in pre-service curricula and should be presented from a comprehensive and multidisciplinary perspective. Research from the areas of education, psychology, and diagnostic practice, as well as from the field of neurobiology, genetics, biology and family should be included (Shyman, 2012; Dunst, 2007; Guralnick, 2005).

Multidisciplinary Based Approach to Methodologies in ADHD

This section presents methodologies that have been effective in working with preschool children with ADHD. Teachers draw on these methodologies to meet the individual needs of each child with ADHD.

Behavioral-based approach
Attention-deficit/hyperactivity disorder (ADHD) is one of the most common behavioral disorders in children. According to the criteria for ADHD in the DSM-IV-TR, ADHD can be diagnosed in young children who exhibit challenging behaviors in early childhood settings if the

behavior has been present for a minimum of 6 months and the child demonstrates at least six or more of the specific behaviors of inattention or hyperactivity/impulsivity prior to the age of 7 years (Fewell et al., 2002). Fewell et al., (2002) believed that one could reasonably observe the three key domains of behavior relevant to an ADHD diagnosis within the context of play in very young children. Specifically, these areas were the activity level in executing actions and the attention and focus with which children engaged in interactions. These areas were consistent with one as in scales that had been used for children as young as 3 years (Gilliam, 1995). Best practice guidelines for attention problems (DuPaul et al., 2008) have identified several effective instructional and behavior management techniques for preventing academic and behavioral problems and improving student performance in children, including task and instructional modifications, contingency management, and proactive structuring of the classroom environment. General education teachers report a lack of confidence in their ability to implement evidence-based strategies for children identified as having ADHD (Arcia et al., 2000), suggesting that further examination of teacher classroom management practices for inattentive students is needed (Murray et al., 2008).

Brock (2009) suggested psychosocial interventions to encourage appropriate behavior such as self-management protocols that involve reminders for a student to monitor his/her behavior. Response-cost systems involve providing a student with a set number of points to start a day. Then points are deducted for problem behavior and children have an opportunity to earn points for appropriate behavior. Points are exchanged for a tangible reward or privilege at a set time. A daily report card of behavior linked to rewards provided to parent on at least a weekly basis.

The 'coaching culture' appears to be expanding rapidly in business and industry (Beckett, 2000). Coaching can be defined as 'the art of facilitating the performance, learning and development of another' (Downey et al., 1999). Coaching can focus on any aspect of a person's life in assisting personal growth. A number of different approaches to coaching exist (Fournies, 2000). Developmental coaching is often treated as a specialty that can simply be added to traditional, behavioral coaching (Laske et al., 2007). The coach also takes into account the learning style (Baker et al., 2002) of the individual child with ADHD. Behavioral coaches (BC) have specialized knowledge and skills in addressing psychosocial and academic success, and thereby are well-positioned to contribute to all three levels of prevention and intervention. BC can provide a continuum of services aimed at social-emotional prevention of problem behaviors (Crone et al., 2010; Eagle et al., 2009), early detection through screening (Cookson, 2001), and intensive intervention (Torgesen, 2006). Such services could involve a BC working directly with children with ADHD; providing team-initiated problem solving (TIPS; Todd et al., 2011) skills for school personnel; and, in all cases, working in collaboration with school personnel and parents (Kazdin, 2005).

Peer tutor
Children with ADHD often show significant amounts of off-task and disruptive behavior during instruction and independent seatwork times in the classroom (Abikoff et al., 2004a, 2004b). Large class size, lack of individualized instruction and prompts, and passive attention may be a few of the key factors that exacerbate existing difficulties of children with ADHD. As a result, they may be less likely to integrate and learn class material, and may demonstrate lower levels of work productivity (Pfiffner et al., 2006). Peer tutoring is a method of instruction in which

children with ADHD are paired with a peer tutor that aids them in learning academic material (Raggi & Chronis, 2006). This method allows for one-to-one instruction that is individually tailored to the child's academic ability and is delivered at the student's own pace (DuPaul and Stoner, 2004).

Computer-assisted instruction
Computer-assisted instruction (CAI) entails the
presentation of specific instructional objectives, highlighting of essential material, use of multiple sensory modalities, division of content into smaller chunks of information, use of repeated trials, and provision of immediate feedback about response accuracy (Ford et al., 2001a; Kleiman et al., 2001; Mautone et al., 2005). This method has been suggested as a way to improve the sustained attention and work performance of children with ADHD (Raggi & Chronis, 2006). Aspects of CAI may help teachers plan individualized activities for students with shorter attention spans, allowing these students to be more actively involved in learning, and increasing confidence and motivation (Fitzgerald, 1994).

Problem-based learning
A report from the National Research Council (2001) describes three principles of learning that are directly applicable to teaching. Children develop ideas and concepts early on and the learning environment must foster both skills and conceptual understanding to make knowledge usable. Children need guidance to learn how to monitor their thinking, to be able to understand what it means to learn and how to do it. Problem-based learning (PBL) is an instructional method which uses "real world" problems as an impulse for learning. In all its manifold variations, PBL is characterized by learning which is student-centered and can occur in small student groups. Teachers are facilitators or guides. Problems form the organizing focus and stimulus for learning and are a vehicle for the development of problem-solving skills. New information is acquired through self-directed learning (Barrows, 1996). Terry Barrett (2005) authored an operational definition of PBL. First students are presented with a problem. Students discuss the problem in a small group and then students learn how to find out more in for motion. In a preschool setting the children work in small groups with an aide or teacher to discover the solution through hands on activity.

PBL is an effective method for improving children's problem-solving skills. Children with ADHD make strong connections between concepts when they learn facts and skills by actively working with information rather than by passively receiving information (Gallagher et al., 2008). PBL has also become increasingly popular across disciplines in K–12 education settings (Hmelo-Silver, 2004; Dochy et al., 2003; Torp et al., 2002; Hmelo et al., 2000; Barrows, 2000; Gallagher et al., 1992).

Reflection
Liaw (2005) introduced a model called constructivist reflection cycle (CRC) which theorizes how individual minds construct knowledge in order to approach deeper theoretical understanding. Reflection provides opportunities for children with ADHD to revise misconceptions and develop deficient understanding. A CRC model is divided into three concepts: An individual expresses (individual mental models), receives comments about their knowledge, and reflects and shapes preliminary perceptions into new expressions. Children with

ADHD reach this stage through learning and prior task performance that becomes structured into meaningful units in memory (Sajadi and Khan, 2011).

Social-emotional learning
A prominent characteristic in children with ADHD is impairment in social functioning. A profound impairment in social functioning is one of the defining features of ADHD. Although many children with ADHD may want to interact with others, they often do not have the necessary skills to effectively carry out social exchanges (Scattone, 2007). SEL was developed as a conceptual framework in 1994 and focuses on the emotional needs of children with ADHD (Greenberg et al., 2005). SEL is defined by the Collaborative for Academic, Social & Emotional Learning (CASEL) as "the process of acquiring the skills to recognize and manage emotions, develop caring and concern for others, make responsible decisions, establish positive relationships, and handle challenging situations effectively" (CASEL, 2006, p. 2). SEL programs for young children seek to promote various social and emotional skills and have been linked to positive social and academic outcomes (Payton et al., 2008). A review on SEL programming conducted by the CASEL found that SEL programs yielded many benefits for children (Payton et al., 2008). Key competencies are taught, practiced, and reinforced through SEL programming (CASEL, 2006). Some of these key competencies are: self-awareness; identification and recognition of one's own emotions, recognition of strengths in self and others, a sense of self-efficacy, and self-confidence. Especially important for a child with ADHD are social awareness, impulse control, stress management, persistence, goal setting, and motivation. The SEL programs build relationship skills, cooperation skills for seeking and providing help, and communication. These competencies are taught most effectively within caring, supportive, and well-managed learning environments. Development of autonomy, self-discipline, and ethics is more likely in environments in which mutual respect, cooperation, caring, and decision making are the norm (Bear, 2005).

Research shows that SEL has positive effects on behavior and academic performance; SEL benefits physical health is essential for lifelong success; and reduces the risk of maladjustment, failed relationships, interpersonal violence, and substance abuse (CASEL, 2008; Wang et al., 2004; Greenberg et al. 2005; & Raver, 2002). Maurice et al., (2006) reported that well-designed and well-implemented SEL programming enhances social-emotional competencies (e.g., assertiveness and communication skills), reduces internalizing and externalizing disorders, and improves academic performance. Young children cannot learn to read if they have problems that distract them from educational activities, problems following directions, problems getting along with others and controlling negative emotions, and problems that interfere with relationships with peers, teachers, and parents (Gifford-Smith et al., 2003). Learning is a social process (Zins et al., 2004, p. 1-14). The National Education Goals Panel (1996) recognized that a young child must be ready to learn, e.g., possess the pre-requisite skills for learning in order to meet the vision and accountability mandates of academic achievement and school success.

Predominant Issues in Pre-school Teacher Training for Children with ADHD

Effective teaching in the classroom is increasingly important (Darling-Hammond, 2006) in preparing pre-school children with ADHD for elementary school. Pre-school teacher training in ADHD must frame the concept of teacher education beyond simply standards and assessments to

show mastery, using a multi-faceted training program which includes hands-on practical experience with many modalities. It must include experimental, practical, and philosophical knowledge of and engagement with the pertinent issues in the field of education for children with ADHD.

McArdle (2010) proposed three tiers of comprehensive teacher education. What teachers need to know and do to become quality teachers (e.g., discipline and content knowledge, curricular knowledge, pedagogical knowledge, and knowledge of self and culture), the current climate of accountability measures and standards, and the visibility of learning, a shared sense of the whole task, purpose, or goal of education. By focusing on specific characteristics of ADHD, a framework of comprehensive and multidisciplinary approaches, and an opportunities for self-evaluation, as well as a focus on EBP, and discussion of the purpose of teaching, the program proposed below meets these guidelines as a comprehensive program of pre-school teacher training.

A growing body of research confirms that in preschool teacher training those who participate in fieldwork combined with course work are better able to understand theory, to apply concepts they are learning in their course work, and to support student learning (Koerner et al., 2002; Denton, 1982; Henry, 1983; Ross, Hughes, & Hill, 1981; and Sunal, 1980). Recent studies of personal preparation suggest that immersing teachers in practice with actual materials and working on particular concepts using these materials can be particularly powerful for teachers' learning (Darling-Hammond, 2006), It is important to offer and foster multidimensional, interactive, and experimental activities that provide direct engagement and application of these methodologies so preschool teachers gain skill in working with children with ADHD (Liberman & Pointer Mace, 2008). Analyzing samples of student work and teachers' plans, videotapes of teachers and students in action, and cases of teaching and learning can help teachers draw connections between generalized principles and specific instances of teaching and learning (Ball & Cohen, 1999; Hammerness, Darling-Hammond, & Shulman, 2002; Lampert & Ball, 1988).

An Ideal Preschool Teacher Training Program in ADHD

According to United States Centers for Disease Control, nearly 7.8% of school-age children demonstrate some type of ADHD in the classroom (Journal of American Medical Association, 2005). Jerome et al. (2006) reported that majority of American practicing teachers in their study did not receive training in ADHD during their pre-service teacher training program. Based on the review, additional teacher training programs need to be developed. To provide a prototype preschool teacher training graduate course proposed below that is designed to train preschool teachers to accommodate children with ADHD in their preschool special education classrooms. A program of course work in ADHD combined with field placement is proposed for the prospective teachers. These field placement experiences are designed to teach theory along with hands on experience in using the proposed competencies in relevant ways in preschool classrooms with children with ADHD. The proposal is designed to address problems associated with inadequate preparation of educators who will teach children with ADHD in preschool classrooms.

It is important for in-service teacher training students to study, understand, and implement different modes and theories of teaching in order to ensure that the most appropriate means of service delivery is being provided to children with ADHD at the preschool classroom (Lovaas, 1996; Scheurmann & Webber, 2002). This will among the first preschool teacher training project proposed specifically for ADHD, and the unique structure of the five term program is outlined below. To be admitted to this graduate program, students would need an earned bachelor degree in education to ensure adequate background knowledge. The proposed coursework and field placement for the preschool teacher training program in special education will be described and summarized below (Table 1).

Table 1
Proposed Course Schedule

Summer term I	Fall term	Winter term	Spring term	Summer term II
Overview of ADHD (4 credits)	Educational & Social Development of Children with ADHD (3 credits)	Curriculum & Educational Assessment for Children with ADHD (3 credits)	Behavioral Management & Classroom Intervention for Children with ADHD (3 credits)	Child-Family Interventions for Children with ADHD (2 credits)
	Practicum I: Educational & Social Development (2 credits)	Practicum III: Curriculum & Educational Assessment (2 credits)	Practicum V: Behavioral Management & Classroom Intervention (1 credit)	Practicum VII: Child-Family Intervention (1 credit)
Diversity in ADHD Education (2 credits)	Collaborating with Families (2 credits)	Special Education Law (3 credits)	Collaborative Educational Planning (1 credits)	Transition Plan for Children with ADHD (1 credit)
Research Methods of Educational Analysis (4 credits)	Behavioral Assessment for Children with ADHD (3 credits)	Differentiated Instructional Teaching Methods for Children with ADHD (3 credits)	Language Disorders in Young Children with ADHD (3 credits)	Overview of Assistive Technology for Children with ADHD (1 credit)

	Practicum II: Behavioral Assessment (1 credit)	Practicum IV: Differentiated Instructional Teaching Methods (1 credits)	Practicum VI: Language Disorder in Children with ADHD (1 credits)	Final Supervised Field Practicum VIII (6 credits)
Total Credits: 10	Total Credits: 11	Total Credits: 12	Total Credits: 9	Total Credits: 11
Total 53 Credits				

The majority of coursework will focus on pedagogy and curriculum, developmental characteristics, educational, language, and social development, family dynamics, behaviors, transitions, differentiated instruction, research methods, assistive technology, and field practicums (Martin, 2012; Ploog et al., 2012; Connor et al. 2010; DuPaul et al., 2008; Brabeck & Shirley, 2003; Barkley et al., 1996; Cantwell, 1996).

Summer term I
Theory will be paired with practice throughout the program. Preschool teacher training students will take three graduate level courses, and will earn 10 graduate credit hours. They will take an overview of ADHD and diversity in ADHD education. Students will also take research methods in educational analysis. The main purpose is to introduce, through a sequence of courses, the knowledge and skills essential to success in working with children with ADHD.

Fall term
During the fall term the students will complete three courses along with two practicums. They will take theory of educational and social development of children with ADHD and a field experience where they can observe and put these ideas into practice. The behavioral assessment for children with ADHD will be paired with a field experience. The students will earn 11 graduate credits. During practicum, the preschool teacher training students will be working in preschool classrooms with students with ADHD under the supervision of qualified professionals and university supervisors. Throughout this term, preschool teacher training students will work in preschool classrooms with children with ADHD to gain skills in educational, social development assessment and behavior assessment for children with ADHD.

Winter term
Preschool teacher training students will take two courses that are paired with a practicum and a third course in and will earn 13 credits. Students will work with qualified professionals and university supervisors to gain experience about curriculum and educational assessment, and differentiated instructional teaching methods for children with ADHD. Students will also observe skilled teachers at their practicum site and write reflections about the curriculum and educational assessment plans for children with ADHD. Students will develop and implement lesson plans using differentiated instructional methods.

Spring term
This term the preschool teacher training students will follow the same pattern of two courses paired with practicums associated with two courses. Students will take theory of behavior management and classroom intervention for children with ADHD along with field experience. Theory of language disorders in young children with ADHD will be paired with a practicum where students will be observing, and learning from a certified speech language pathologist. Preschool teacher training students will be working in preschool classrooms with children with ADHD to gain practicum skills in the field of language development, behavior management, and classroom management. The students will also take collaborative educational planning and will earn 12 credits.

Summer term II
Summer term will follow the same pattern: three graduate courses along with two practicums, earning a total of 14 graduate credits. Students will take theory and practicum of child-family intervention for children with ADHD. They will also take transition planning for children with ADHD, and overview of assistive technology for children with ADHD. They will complete their final supervised field practicum in a preschool ADHD classroom under the supervision of qualified teachers and university supervisors. In this term, the preschool teacher training students will complete their course work. They will also appear for an oral presentation. Satisfactory completion of the oral presentation will be necessary to obtain the degree. This training will enhance their knowledge and skills as professional educators in field of preschool ADHD, and prepare them to meet the needs of children with ADHD.

Conclusion

The nature and prevalence of ADHD in children, and the challenges children with ADHD bring to the pre-school classroom were discussed in the paper. Methodologies for behavior management that research has shown to be effective for children with ADHD were discussed. Evidence–based strategies to support children with ADHD were reviewed and the need for social skills instruction for children with ADHD was discussed.

The role of the preschool teacher is important in optimizing the early development of children with ADHD. Many preschool teachers are not aware of what researchers have learned and the information given in this program is practical and immediately useful to teachers, in working with children with ADHD. Since attention deficit hyperactivity disorder is a complex disorder, surfacing in the preschool years and manifesting symptoms (full and/or partial) throughout adulthood, it is not surprising that there are no simple teaching methodologies agreed upon by all. However, since the needs of children with ADHD are specialized, research findings support that children with ADHD will benefit from specialized programs at the preschool level, if their teachers are trained to meet their needs.

This paper proposed a conceptual framework and ideal program of study to train preschool teachers to work with children who have ADHD. Research (Corkum et al., 2005; Wender, 2004; Zentall & Javorsky, 2007) supports the design of this training program, indicating that hands-on practical field experience in addition to coursework, combined with supervision and feedback from an experienced and certified teacher, will be more effective than coursework alone. Special

education law has mandated that educators must meet the needs of each individual child. Therefore, preschool teacher training in the field of ADHD that is evidence based is essential in order to meet the needs of individual children. This teacher training program constitutes first steps in helping teachers meet the needs of preschool children with ADHD. Further research is needed to determine what kind of teacher training best prepares teachers to work with children with ADHD, and which teaching methodologies are most effective for children with ADHD in the preschool classroom.

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