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Preschool Teachers' Knowledge, Opinions, and Educational Experiences with Attention Deficit/Hyperactivity Disorder

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Abstract: *The main purpose of this exploratory study was to investigate preschool teachers' past educational experiences, knowledge, and opinions related to ADHD. A second purpose was to determine if specific teacher variables (e.g., years of experience) were associated with higher knowledge of ADHD as measured by a criterion-referenced test. One hundred thirty-eight preschool teachers completed a questionnaire that included demographical information and questions related to knowledge and experiences with ADHD in preschoolers. Descriptive findings indicated that preschool teachers' most common educational experiences related to ADHD included reading articles in magazines and journals. In addition, preschool teachers did not feel that they knew very much about the process of assessing ADHD in preschoolers. Analyses of teacher variables revealed that teachers with graduate level educations did better on the test on ADHD than teachers with vocational or high school level educations. Results also indicated that teachers' ratings of their own knowledge of ADHD were not associated with test performance. The implications of these findings for professional development are discussed.*

Attention Deficit/Hyperactivity Disorder (ADHD) is one of the most prevalent childhood disorders affecting 3–5% of the school-aged population (Barkley, 2001). Research with preschoolers has found that many preschoolers evidence ADHD symptomalogy including attention problems, impulsivity, and hyperactivity and about half will continue to have severe behavior problems in these areas into their school years (Campbell, 1997). Although ADHD is a very prevalent disorder with an onset in the preschool years, there is no known research that has investigated preschool teachers' knowledge of ADHD. Research on preschool teachers and ADHD is important for two reasons. First, preschool teachers are a main influence in the lives of children in their formative years, and therefore it is critical that preschool teachers' knowledge, opinions, and educational experiences related to ADHD be assessed. Second, and relatedly, the information from such assessments should be used to help target needs for professional development.

Professional development in the area of ADHD is particularly important for preschool teachers. Preschool teachers need to have accurate information and appropriate educational experiences because the behavior associated with preschoolers with ADHD is often challenging and demands tolerance and understanding from teachers. Accordingly, the two purposes of this study are to investigate preschool teachers' past educational experiences, knowledge, and opinions related

to ADHD and to explore if specific teacher variables (e.g., years of experience) are related to greater knowledge of ADHD. As there is a dearth of research with preschool teachers in the area of ADHD, a review of past research investigating these areas with teachers of school-aged children follows.

Teacher Experiences, Knowledge, and Opinions

Past research with teachers of school-aged students with ADHD has investigated teachers' educational experiences, knowledge, and opinions related to ADHD. From the available research it appears that teachers do not receive much training on ADHD in their undergraduate education programs. That is, 89% of elementary school teachers reported that they had no instruction on ADHD during their college education and 92% had only a little training on ADHD after graduation (Jerome, Gordon, & Hustler, 1994). Similarly, 96% of regular and special educators said that they received little to no training in pharmacological treatments for ADHD (Kasten, Coury, & Heron, 1992).

Given inadequate educational experiences in the area of ADHD, it is important to determine whether teachers have an accurate knowledge-base of the etiology and characteristics related to ADHD. Research has generated support for certain causes for and characteristics of ADHD. For example, the causal factors that have extensive research to substantiate them are all biologically based and include factors that are either genetic (inherited) or due to brain injury that occurred pre, peri, or postnatally (Barkley, 1998; Malyn, 1993). Causes of ADHD that have not received research support include poor parenting, family stress, and sugar or food additives (Krummel, Seligson, & Guthrie, 1996; Malyn, 1993). Research has found that 69% of general educators representing all grade levels and 87% of elementary school teachers reported a biological or genetic basis for ADHD (Malyn, 1993; Jerome et al., 1994). However, these studies found that the teachers reported that they believed other factors, that do not have research support, were also major causes of ADHD. That is, 66% of elementary school teachers reported that they believed that ADHD was caused by sugar or food additives (Jerome et al., 1994). However, in Malyn's (1993) research, when regular education teachers were asked to indicate whether sugar or food additives contributed substantially to ADHD, only approximately 18% indicated yes for food additives and approximately 23% affirmed the contribution of sugar. Additionally, over 20% of elementary teachers reported that poor parenting or a dysfunctional family were causes of ADHD (Jerome et al., 1994) and approximately 36–40% of general education teachers believed these factors contributed a great deal to the occurrence of ADHD (Malyn, 1993). Overall, many teachers have misconceptions related to the etiological basis for ADHD. These misconceptions are important to dispel among teachers as they may relate directly to the treatment options that teachers recommend and/or adopt. For example, in the research that found that two-thirds of teachers believed there were dietary causes for ADHD, teachers overwhelmingly believed that special diets were helpful treatments for ADHD (Jerome et al., 1994).

Research has also generated support for the characteristics of ADHD and many studies have specifically found that (a) attention problems in children with ADHD do continue through adolescence, (b) boys are more likely than girls to have ADHD, and (c) attentional problems can exist without concomitant hyperactivity (Barkley, 1998). Research has investigated teachers' knowledge of these characteristics and found that 50–71% of teachers of school-aged children believed that attention problems continue through adolescence (Hawkins, Martin, Blanchard, & Brady, 1991; Jerome et al., 1994). Research has also found that 80% of elementary teachers reported accurate answers related to the prevalence of ADHD in boys and girls (i.e., more common in boys; Jerome et al., 1994) and 79% of teachers representing elementary, middle, and secondary grade levels correctly indicated that students can have attentional deficits without hyperactivity (Hawkins et al., 1991). Thus, according to the research, most teachers of

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school-age children understand some of the key characteristics of ADHD.

Research has also been conducted in the area of pharmacological treatments for ADHD. Researchers have unequivocally concluded that medication alone is not the best treatment option for children with ADHD; only short-term effects have been documented for medication treatments and the long-term benefits have not been substantiated by research (Barkley, 1998; Pelham, Wheeler, & Chronis, 1998). Therefore, some combination of pharmaceutical, educational, and home-based interventions are needed. Interestingly, teachers have also reported that they believe medication alone is not the best treatment option. In one study, 98% of regular and special education teachers reported that they did not believe medication alone was the best treatment option for ADHD (Kasten et al., 1992). Other research has documented that only 24% of American elementary school teachers reported that they believed ADHD could be treated with medication alone (Jerome et al., 1994) and 79% in another study reported that medication alone is not sufficient to remediate problems associated with ADHD (Hawkins et al., 1991).

Related to medication usage, teachers have generally reported different opinions based upon their specialty area and grade level. That is, middle school teachers were more likely than elementary school teachers and special education teachers were more likely than general educators to believe that medication is being overprescribed for ADHD (Kasten et al., 1992). In fact, only 7% of general educators reported that they believed that medication was overprescribed in comparison to 35% of special educators. Another study found that 42% of teachers of school-aged children reported that they were not sure if medication was being overprescribed for the treatment of ADHD (Davino, Lehr, Leighton, Miskar, & Chambliss, 1995). According to other research that has assessed teachers' opinions regarding medication usage, one study documented that 67% of general educators believed that medication was not necessary for the treatment of ADHD (Hawkins et al., 1992). Perhaps teachers' variability in responses related to medication use is due to the fact that some teachers are not reporting accurate etiological bases for ADHD. That is, if a teacher believes that ADHD is caused by poor parenting or diet, that teacher may be less likely to see the value of medication (even when medication is only part of an intervention package).

Research has documented that there may be several teacher characteristics associated with their knowledge of ADHD. Research has documented that elementary school teachers with more experience and training did better on a 20-item test of their knowledge of the characteristics and causes of ADHD (Jerome et al., 1994). Similar research investigated the relationship among teachers' years of experience, prior training and teaching experiences directly related to students with ADHD, and confidence teaching students with ADHD (Reid, Maag, Vasa, & Wright, 1994). This study found that prior training in ADHD and prior experiences working with a student with ADHD positively influenced teachers' confidence for teaching students with ADHD in the future. Thus, the teacher characteristics that are potentially important to assess include years of teaching experience and educational experiences directly related to teaching students with ADHD.

Purpose of Present Study

In summary, it is important that teachers work effectively with preschoolers who are showing the beginning signs of any disorder, including ADHD. In order to work effectively with children, it is important to understand the causes and common characteristics related to their disorder. An assessment of knowledge, opinions, and educational experiences related to ADHD is particularly important for the population of preschool teachers as teachers of children at this age are not required to have college level educations, and, as a result, may have little or no educational experience in this area.

This study extended past research with teachers of school-aged children by conducting an exploratory analysis of the educational experiences that preschool teachers have had related to ADHD. In addition, teachers' opinions related to various issues in the area

Table 1. Teacher Characteristics

Demographic variable	% of teachers with characteristic
Gender	
Male	5%
Female	95%
Ethnicity	
Caucasian	82%
African American	18%
Job Status	
Full-time	75%
Part-time	25%
Education Level	
High school/vocational	17%
Some college or undergraduate degree	67%
Some graduate school or graduate degree	16%
Years of Experience	
0 to 4 years	60%
5 to 9 years	20%
10+ years	20%

of ADHD, including medication usage, were assessed. This study further explored if specific teacher characteristics (independent variables) were differentially related to higher scores on an ADHD criterion-referenced measure of knowledge (dependent variable). As documented in past research, years of experience and educational level were assessed as possible teacher characteristics that may be associated with greater knowledge. Educational level was particularly important to assess in this study, as many preschool teachers do not have college degrees. Full or part time status was also used as an independent variable due to the number of teachers who work part time in preschools. The last teacher characteristic to be included as an independent variable was teachers' perceived knowledge of information related to ADHD.

Method

Participants

Participants in this study included 138 preschool teachers. Demographic data was obtained from the teachers and is included in Table 1. Participants were predominantly female, Caucasian, full time teachers with some college or an undergraduate level education, and most had less than four years of teaching experience. The teachers who participated in this study were teachers of children who were between the ages of three and six years. Thus, infant and toddler teachers were not included.

Measures

The Preschool ADHD Questionnaire included three sections. Items for the questionnaire were selected based on a review of the literature in this area (e.g., Jerome et al., 1994; Reid et al., 1994). Section 1 of the questionnaire included a demographic section related to teachers' gender, job status, educational level, number of years teaching, and educational experiences related to ADHD (e.g., reading a book on ADHD). Teachers were also asked to rate their own knowledge in the area of ADHD (dichotomous rating: 1 = little to no perceived knowledge; 2 = moderate to extensive knowledge). Section 2 of the questionnaire included questions related to teachers' opinions related to ADHD in preschoolers. Teachers reported their opinions on current trends and issues in the field of ADHD by answering true or false to the following items: "It is easy to tell which preschoolers have ADHD;" "Too many preschoolers are on medication for ADHD;" "I understand how ADHD is assessed in preschoolers;" "There are ways to channel the hyperactivity of preschoolers with ADHD;" and "Taking recess away from a child with ADHD is an appropriate form of punishment."

Section 3 of the questionnaire included a thirteen-item, criterion-referenced measure of knowledge in the area of ADHD. As this research is of an exploratory nature, knowledge of several different aspects of ADHD was assessed. The questions on the ADHD knowledge measure were selected based on research that has consistently documented one correct (better) answer. Ten items were taken directly from three past studies (Davino et al., 1995; Hawkins et al., 1991; Jerome et al., 1994) and three items were added. The three new items included in the measure were, "As a group, preschoolers with ADHD are more aggressive;" "According to federal law, schools are not required to pro-

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vide special services to children with ADHD unless the child also has some other disability (e.g., learning disability);" and "EEGs are accurate diagnostic tools for assessing ADHD." These items were taken from research in the field that has documented that preschoolers with hyperactivity are more aggressive than their peers without hyperactivity (Alessandri, 1992), and that schools have to provide services for students with ADHD if their disability adversely affects their educational performance (Turnbull & Turnbull, 2001). Research has also found that EEGs are not accurate diagnostic tools for diagnosing ADHD (Barkley, 1998).

To support the content validity of the knowledge test, the research in this area was reviewed. For each of the true/false questions, research has documented a better or correct answer (Alessandri, 1992; Barkley, 1998; Goodman & Stevenson, 1989; Krummel et al., 1996; Stormont-Spurgin & Zentall, 1995; Turnbull, Turnbull, Shank, & Leal, 1999). Even though 10 of the 13 questions were taken from past research, to date, the internal consistency of these items or of similar brief ADHD knowledge measures has not been established. As a result the knowledge test was piloted in this study with the 138 teachers and the internal consistency of the test was determined.

Procedures

A letter of invitation and a brief description of the study were mailed to the directors of all licensed preschools ($N = 41$) in a mid-sized midwestern city. Directors were promised a professional development workshop with the first author at the conclusion of the data collection as an incentive to participate in the study. After the second follow-up mailing, 30 (73%) preschool directors agreed to participate. From these preschools, 191 teachers were invited to participate in the study and 138 provided consent and participated. The overall response rate for teachers was 72%, which meets the criteria for a good response rate in survey research (Babbie, 1990).

After permission was obtained, each director was contacted by phone and given the choice of having a graduate research assistant administer the questionnaires to teachers during a convenient time (e.g., nap time) or having the assistant leave the questionnaires and pick them up later. The questionnaires took approximately 40–50 minutes to complete. One of two graduate research assistants delivered and either administered the questionnaires or set a time to come back and pick up completed questionnaires. When directors chose to administer the questionnaires themselves, steps were taken to ensure the confidentiality of teacher responses by providing instructions asking the teachers to place completed questionnaires into an envelope and to seal the envelope. All teachers were provided with written instructions requesting that they complete the questionnaire to the best of their ability, and to not discuss their answers with other teachers or to consult any resource materials while completing the questionnaire.

Teachers in this study first completed the Preschool ADHD Knowledge Questionnaire and then completed an Intervention Preferences Survey. The latter survey included 43 strategies that could be used with children with ADHD and instructions for teachers to rate each item according to importance and to comfort implementing the strategy. It was the purpose of another study to investigate teachers' opinions of these research-based practices (Stormont & Stebbins, 2001).

Results

The first purpose of data analysis was to perform a descriptive analysis of preschool teachers' informational experiences related to ADHD (e.g., read a book), their opinions related to current trends in the field (e.g., medication), and their responses on the ADHD knowledge test. A second purpose of data analysis was to determine whether certain teacher characteristics were related to higher test scores. Of particular interest for this study were the following 4 teacher characteristic variables, which were entered as independent variables in Analyses of Variance, with test scores serving as the dependent variable: years of teaching experience (3 levels: less than 1 year-4 years; 5–9 years, and 10+ years), educational level (3 levels: high school or vocational school; some college or under-

Table 2. Descriptive Analysis of Preschool Teachers' Responses to Past Educational Experiences, Current Issues, and Trends Related to AD/HD for the Overall Sample and by Educational Level

Item	Yes (True)	No (False)	High school or vocational	Some college or degree	Some graduate or degree
Educational Experiences Related to AD/HD					
Talked with a Doctor about a Student	7%	93%	0%	11%	14%
Read a Book	34%	66%	19%	34%	52%
Read a Journal Article	61%	39%	25%	64%	81%*
Read a Magazine Article	81%	19%	71%	80%	90%
Viewed a Television Show	55%	45%	68%	56%	41%
Viewed a Video	28%	72%	29%	26%	33%
Took a Course that Included Information on AD/HD	50%	50%	19%	55%	62%*
Inservice	29%	71%	30%	26%	38%
Workshop	36%	64%	27%	34%	55%
Took a Course on AD/HD	6%	94%	5%	2%	24%*

Note. * $p < .05$

graduate degree; some graduate school or graduate degree), perception of knowledge related to ADHD (2 levels: little or no perceived knowledge; moderate to extensive perceived knowledge), and full or part time teaching status.

Descriptive Analysis

The educational experiences of teachers are presented in Table 2. Overall, the most common educational experiences of preschool teachers include reading a magazine article and reading a journal article that included information on ADHD. Approximately half of preschool teachers had viewed a television show on ADHD or took a course that included information on ADHD. Fewer than half of the preschool teachers reported the experiences of going to a workshop or inservice on ADHD or reading a book on ADHD. The lowest percentages related to educational experiences and ADHD were talking with a doctor about a student with ADHD and taking a course specifically on ADHD.

In regard to their reported opinions, the majority of teachers (68%) believed that too many preschoolers are put on medication for ADHD. Related to assessment issues, 77% of preschool teachers indicated that it is not easy to tell which preschoolers have ADHD and 65% did not feel that they had an understanding of the assessment process for ADHD. Related to interventions and behavior management practices, an overwhelming 98% of preschool teachers believed that there are ways to appropriately channel hyperactivity in preschoolers with ADHD and 98% also believed that taking recess away from preschoolers with ADHD is not an appropriate punishment.

Internal Consistency

The internal consistency of the ADHD knowledge measure was determined before group analyses were conducted. The internal consistency for the 13-item test was low, yielding a reliability coefficient (alpha) of only .41. As a result, another internal consistency analysis was conducted to determine if the reliability for the test would be higher if certain items were deleted. The results indicated that the reliability of the test would in fact be higher if three items were eliminated: "As a group, preschoolers with ADHD are more aggressive;" "According to federal law, schools are not required to provide special services to children with ADHD unless the child also has some other disability (e.g., learning disability);" and "There are some activities (e.g., Nintendo, outside play) that seem to normalize the behavior of preschoolers with ADHD." The final internal consistency reliability, using the Kuder-Rich-

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Table 3. Preschool AD/HD Test Items and Teacher Performance on Individual Items

Item (correct answer indicated)	Correct	Incorrect
1. AD/HD has a biological basis. (True)	81%	19%
2. Excessive sugar intake has been found to be a major contributor to symptoms of AD/HD. (False)	75%	25%
3. Girls are more likely to be hyperactive than boys. (False)	95%	5%
4. AD/HD is a condition that children will out-grow. (False)	77%	23%
5. EEGs are accurate diagnostic tools for assessing AD/HD. (False)	59%	41%
6. Children with AD/HD can have problems with attention but not be overactive. (True)	66%	34%
7. Children can develop AD/HD after extreme family stress such as the loss of a parent or parental divorce. (False)	58%	42%
8. Food additives in a child's diet have been found to be the main cause of AD/HD. (False)	80%	20%
9. Medication alone is the best treatment option for AD/HD. (False)	98%	2%
10. Parental upbringing is responsible for AD/HD in children (False)	92%	8%

ardson formula 20, for the 10-item test was .61. This internal consistency coefficient is in the substantial correlation range (Power, 1991). The reliability of the test could have been affected by the limited number of items used to represent many different facets of ADHD. Longer tests and more homogeneous tests tend to have higher reliabilities (Sattler, 1992). However, the reliability of the test was considered adequate for the purpose of this study.

The percentage of correct scores on individual items of the ADHD knowledge measure are presented in Table 3. To summarize the responses, most teachers correctly answered each of the 10 questions. The items that reflected the highest incorrect percentages included assessment issues. That is, 42% of teachers indicated that they believed children can develop ADHD as a result of family stress and 41% of teachers indicated that EEGs are accurate diagnostic tools for assessing ADHD. In addition, although 81% of teachers correctly answered that ADHD has a biological basis, the nature of the biological difference may not be clear to all teachers. That is, 25% of teachers believed that sugar is a major contributor to symptoms of ADHD and 20% believed food additives are the main cause of ADHD in preschoolers.

Analysis of Group Differences

Results from the four one-way ANOVAs indicated that one of the four teacher characteristics yielded significant differences on ADHD knowledge scores. A significant difference was documented for educational level of teachers [F (2, 135) = 5.61; p = .005]. A follow-up Tukey analyses indicated that teachers with graduate level educational experiences (M = 8.64, SD = 1.56) did significantly better on the ADHD knowledge test than teachers with high school or vocational level educations (M = 6.83, SD = 1.50). Teachers with undergraduate level college experiences did not differ from the other two groups (M = 7.77, SD = 1.93). Group differences on knowledge scores were not documented for the number of years teaching [F (2, 135) = 2.09; p = .13] or for full- or part- time status [F (1, 136) = 1.10; p = .30]. Interestingly, teachers' perceptions of their knowledge of ADHD [F (1, 133) = .15; p = .70] did not yield group differences on the test.

Supplementary Analysis

As teachers' educational level was associated with higher test scores, chi-square analyses were conducted to explore if teachers at higher educational levels differed in terms of their specific educational experiences related to ADHD (See Table 2). Overall, two significant findings were documented. Teachers at different educational levels differed in their educational experiences related to reading a journal article on ADHD [$\chi 2$ (2, 131) = 14.75; p = .0006], and taking a course that included information on ADHD [$\chi 2$ (2, 131) = 10.06; p = .007]. For both experiences, teachers at the graduate level had the highest percentage and teachers with a high school or vocational level experience had the lowest percentage.

To determine if these specific educational experiences were, by themselves, associated

with higher test scores, *t* tests were conducted for both dichotomous grouping variables (i.e., read a journal, took class with ADHD information) with test scores serving as the dependent variable. No significant differences were documented, which indicated that reading a journal ($T = -1.46$; $p = .147$) and taking a course with ADHD information ($T = -.57$; $p = .57$) by themselves were not associated with different mean test scores. Thus, the ANOVAs were not rerun with these variables serving as covariates.

Discussion

As stated in past research, it is important that teachers' knowledge and perceptions of ADHD be understood as this will likely influence the selection and implementation of interventions for children (Reid et al., 1994). Although preschool teachers have extensive interactions with children showing the characteristics of ADHD, no research has been found that has assessed preschool teachers' knowledge in this area. The study is a first step in understanding preschool teachers' educational experiences, opinions, and knowledge of ADHD.

To explore past educational experiences, preschool teachers were asked to indicate whether that had participated in 11 educational activities. The most common educational experience cited was reading a magazine article. While 81% of preschool teachers had read a magazine article on ADHD, only 61% had read a journal article. Further descriptive analyses indicated that most of the teachers who had read a journal article had at least some college experience. Only 25% of teachers with high school or vocational level educations had read a journal article on ADHD. This descriptive research is important because without quality educational experiences, including reading journal articles with summaries of scientific research, teachers may only be exposed to information from the popular media. This is particularly concerning in the area of ADHD because many fads and myths have been widely disseminated. Barkley (1998) nicely summarized myths related to the causes of ADHD that have been perpetuated by the media. Such myths include food additives, sugar, fluorescent lighting, problems in the vestibular system, yeast, and poor parenting. Perhaps the most concerning recent myth has been sugar. Even though there has not been one well controlled scientific study to support sugar as a cause of ADHD, this myth was so widespread that in the late 1980s, according to Barkley, the game show *Jeopardy* cited sugar as the cause of hyperactivity.

To explore preschool teachers' knowledge of specific characteristics, causes, assessment issues, and interventions for children with ADHD, a knowledge test was piloted on this sample of preschool teachers. Findings corroborated past research in this area. Specifically, the majority of teachers answered questions correctly and some were still supporting myths related to the causes of ADHD (Jerome et al., 1994; Malyn, 1993). Most teachers correctly acknowledged the biological basis for ADHD, that boys are more likely to have ADHD than girls, that most children do not outgrow ADHD, that children can have problems with inattention and not with hyperactivity, and that medication alone is an appropriate treatment option for ADHD.

Teacher characteristics that may be related to greater knowledge of ADHD were also investigated in this study. A main finding in this area was that the educational level of teachers was associated with knowledge of ADHD. That is, teachers with graduate level educations or degrees did better on the test than teachers with high school or vocational level degrees. Teachers with college undergraduate experiences or degrees did not differ from either group. The percentages correct on the 10-item criterion-referenced measure were 86% for teachers with graduate level educational experiences, 78% for teachers with undergraduate level college experiences, and 68% for teachers with high school or vocational level educations. Teachers' years of experience and their teaching status (full or part-time) were not associated with knowledge scores. Additionally, we found that preschool teachers' perceptions of their own knowledge related to ADHD were not associated with higher knowledge scores. Thus, metacognitively, preschool teachers may not know what they do not know about ADHD in young children.

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This study also explored preschool teachers' opinions on medication uses, assessment, and intervention practices. The majority of preschool teachers in the current study (68%) believed that too many preschoolers are placed on medication for ADHD. Past research has documented that much smaller percentages of general (7%) and special (35%) educators reported that they believed medication was being overprescribed as a treatment for older children with the disorder (Kasten et al., 1992). Perhaps it can be speculated that the different findings for teachers of older and younger students are related to the fact that some preschool teachers are keenly aware of developmental variations especially related to activity levels, impulse control, and attention problems in young children. Therefore, preschool teachers may be wearier of intrusive interventions, such as medication, for children at such a young age. Preschool teachers may also be concerned with how professionals identify preschoolers with ADHD given these developmental variations. In fact, 77% of preschool teachers in this study reported that it was not easy to tell which preschoolers have ADHD and 65% of preschool teachers reported that they did not understand how ADHD is assessed. This finding supports past research that has found that less than one third of general education and special education teachers have been trained to use specific identification techniques for students with ADHD (Hawkins et al., 1991).

Limitations

The generalizability of the results of this study is limited for many reasons. First, only one geographical region of the country and one mid-sized community was included in this study. Second, only females were included in this sample, with the majority also from Euro-American backgrounds. Third, participants in this study were fairly educated preschool teachers with 83% having at least some college background or a college degree. Thus, when interpreting results from this study, early childhood professionals need to use caution and compare their demographics to the teachers in this study. Future research is needed to extend findings from this study to other samples with more diverse characteristics.

Implications

Preschool teachers can have a large affect on children with special needs and their families. Due to the fact that many preschoolers with ADHD have challenging behavior, teachers need to understand their individual needs and the nature of their disorder. If preschool teachers believe that poor parenting or sugar causes ADHD, then they may be less supportive and accommodating in the classroom environment. However, if preschool teachers understand the biological basis of ADHD, they may be more supportive of individual differences and provide more appropriate support for families of preschool children with ADHD. As an initial exploration of preschool teachers' experiences and knowledge in this area, this study identified possible need areas for professional development for preschool teachers.

Professional development recommendations should be interpreted with caution due to the limited generalizability of these findings to other samples. Thus, coordinators of professional development should identify similar needs for their preschool teachers. In this study, understanding the assessment process was identified as a need area. Preschool teachers reported that they did not understand the assessment process and that they did not think that it is easy to tell which preschoolers have ADHD. In addition, many teachers reported inaccurate causes and assessment procedures, which could be remediated with a thorough presentation of an appropriate assessment protocol for children with ADHD. Specifically, on the ADHD knowledge measure, many teachers indicated that children could develop ADHD as a result of family stress and that EEGs are accurate diagnostic tools for assessing ADHD.

Another implication from this study is that professionals need to support preschool teachers by selecting reading material that reflects valid information related to ADHD. Many popular magazines report the current "hot" topics and issues and may promote more misconceptions related to ADHD (e.g., diet causes ADHD). Thus, preschool direc-

tors and professionals could pull together a resource bank on ADHD for preschool teachers that includes video, audio, and print resources that have accurate information. From this study two addition considerations for professional development may be warranted. First, teachers with high school or vocational level educations had the greatest need for quality educational experienced related to ADHD. Second, having preschool teachers select their own deficit areas for professional development may not be the best technique for targeting where teachers need more information in an area. Given the sometimes low quality of past educational experiences (reading in magazine) and the finding that teachers' perceived knowledge did not predict their actual test scores, teachers may not have accurate knowledge in the area of ADHD.

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