EFFECTIVENESS OF FAMILY, CHILD, AND FAMILY-CHILD BASED INTERVENTION ON ADHD SYMPTOMS OF STUDENTS WITH DISABILITIES

Mokhtar Malekpour
Sara Aghababaei
Samira Hadi
University of Isfahan

The aim of the present study was to investigate and compare the effectiveness of family, child, and family-child based intervention on the rate of ADHD symptoms in third grade students. The population for this study was all of students with ADHD diagnoses in the city of Isfahan, Iran. The multistage random sampling method was used to select the 60 subjects included in this study. The subjects were randomly assigned into four groups, including three experimental and one control groups (each group consisted of 15 students). The children had been diagnosed by clinicians as having ADHD. In order to verify this diagnosis, Conner's parental rating scale was used at baseline to confirm that children had ADHD. The results of the post test indicated a significant difference between the four groups. The results showed that the family-child based intervention was the most effective method to decrease students' ADHD symptoms.

Introduction

The Attention Deficit/ Hyperactivity Disorder, (ADHD), is a sustainable pattern of lack of attention, hyperactivity and impulsive behaviors which are more severe and prevalent than the behaviour of the children without ADHD at a similar developmental level. In order to diagnose ADHD, some symptoms would appear before the age of seven; although most of the cases are diagnosed years after its appearance (Kaplan & Sadock, 2000). Recently, the requirement of proven impairment before the age of seven has been challenged and modifications to better address the issue in the upcoming Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-V; American Psychiatric Association, 2000) criteria have been suggested (Bell, 2011). ADHD is one of the most common childhood neurodevelopmental disorders, affecting three to seven percent of school-aged children, with diagnosis more common in boys (5th ed.; DSM-V; American Psychiatric Association, 2000; Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007).

The basic symptom domains of ADHD, as defined by the diagnostic classification systems, are hyperactivity, impulsivity, and inattention. Empirically, ADHD is not limited to the basic symptoms but can be associated with cognitive deficits (Frazier, Demaree, & Youngstrom, 2004; Hervey, Epstein & Curry, 2004) and functional impairment in various life domains (e.g., Biederman et al., 1998, 2006). For example, ADHD is related to academic underachievement (Biederman et al., 2008; Roy-Byrne et al., 1997), and individuals with ADHD often have a history of school problems that cannot be explained by learning disabilities (Seidman, Biederman, Weber, Hatch, & Faraone,1998).

Every culture has children with ADHD (Barkley, Cook & Jr. Diamond, 2002). Ross (1987) found that classrooms in Thailand have comparatively fewer students with ADHD because children are expected and trained to behave and talk quietly in public in Thailand (Moon, 2011).

Likewise, East Asian countries have lower rates of ADHD diagnosis, mainly due to their cultural background, Confucianism. East Asian societies highly value education, harmony with others, and loyalty to the country, parents, and elders. The cultural environment of East Asian countries contributes to having fewer students with ADHD and different concerns in the classroom setting when compared to US classrooms (Moon, 2011). In addition, there is some evidence suggesting that cultural factors may modulate the clinical manifestation of disruptive behavior disorders and ADHD (Livingston 1999;

Reid,1995). According to Batchelder (2003), social and cultural factors are keys to understanding trends in ADHD diagnosis and methylphenidate treatment (Moon, 2011).

Primary therapies emphasize medication and behavior therapy (Chronis, Jones, & Raggi, 2006). However, cognitive, behavioral-cognitive and neuro-cognitive interventions are being continued to be as other options for therapy (Barkley, 2006). In another category, these therapeutic approaches can be in the form of peers, classmates, school based, family based and child based interventions. Generally, helping these children who suffer from ADHD requires a comprehensive therapeutic method which is called a multi-pattern therapy which includes parents and child training, behavior management, usage of stimulant drugs, scheduling and suitable institutional supports (Behboudi, 2007).

Since behaviors of children with ADHD often damage parent-child relationship and increase stress among parents (Johnston & Mash, 2001), a part of therapy would be the direct working with parents in order to modify their child rearing style in order to increase positive consequences for their children (Pelham, Wheeler, & Chronis, 1998). Parent training is more common than other family interventions. Barkley (2001) points out parental need for behavior management in treatment of children with ADHD. According to a meta-analysis study carried out by Fabiano, Pelham, Coles and Gnary (2009), 174 studies where the results indicated that behavior therapy was very effective in dealing with ADHD. Macford and Barlow (2004) did a qualitative study in which the effects of parental training were examined. The participants, who all were mothers, have reported an increase in their feeling of sufficiency, the decrease in psychic tension and increase in child obedience. Results from one study done by Hooshvar, Behnia, Khooshabi, Mirzaei and Rahgozar, (2009) also suggested that parents' group training, concomitant with medication and occupational therapy programs, can play an outstanding role in decreasing harassing behavior problems, anxiety problems and hyperactivity. Hajebi, Hakim Shooshtari and Khajoddin (2005) found that teaching behavioral management to parents leads to the decrement of ADHD symptoms in their children.

In a meta-analysis done by Farmer, Compton, Burns and Robertson (2002) the efficacy of family based intervention was investigated. The result showed that family based intervention decreased ADHD symptoms. Kazdin (2001) showed that family based and child based interventions had a good impact on decreasing ADHD symptoms. With regard to the results of these studies, the aim of this study is to compare the efficacy of family based, child based and family-child based interventions on the rate of ADHD symptoms of third grade students' ADHD symptoms. Although, this research is repeated research but, it has been done in Iranian society, city of Isfahan (with more than two millions population). This research is done for the first time in Iran (city of Isfahan).

Method

The statistical population of this study included all nine years old third grade elementary male students with ADHD in Isfahan city, Iran. The sample of this study included 60 third grade elementary male students with ADHD. A multistage random cluster sampling method was used to select subjects, of six educational areas of Isfahan city and two areas were randomly selected. Then of these two areas 13 schools were randomly selected. Finally of these 13 schools, 60 male students with ADHD were randomly selected. These students were randomly assigned into four groups (three experimental groups and one control group, each group included 15 students).

The following criteria were considered for samples in order to enter the research: 1. no intellectual disability; 2. having no specific and clear disorder except ADHD; and 3. parents' written consent for their children's participation.

Research Method

After schools were randomly selected, Conner's parental questionnaire (2001) was distributed among parents of students. Then, 60 students, identified as having ADHD by parents and professional, were assigned into four groups (each group with 15 students- three experimental and one control groups). These three experimental groups received family based, child based and family- child based interventions. The family based intervention according to Barkley program (Carr, 1999) and child based intervention including attention training, memory training, mind-body integration training and eye movement training (Moor & Fallah, 2001) were given to the experimental groups. For experimental groups, 30 training sessions (10 sessions of child based intervention, 10 sessions of family based and 10 sessions of family- child based) were used (each session continued for 60 minutes). At the end of

training sessions, Conner's parental questionnaire was again administered to the experimental and control groups as post-test.

Instruments

In this research, Conner's rating scale was given to parents in order to rate their children's ADHD symptoms. This scale was designed by Conner (2001) and consists of 27 items. The scale is designed to measure the intensity of ADHD symptoms. Conner's scale is one of the most well-known instruments for assessing of ADHD which is used by various researchers. Family based intervention, child based intervention, and family- child based intervention were the independent variables.

Results

The results of ANCOVA analysis regarding the effect of child based, family based and family- child based interventions on the rate of ADHD symptoms are presented in Table 2. In this analysis, the effect of pre-test was controlled. Descriptive data are presented in Table 1.

Table 1. Mean and Standard Deviation Scores of Pre and Post ADHD Symptoms in Experimental and Control Groups

Group		pretest	posttest
mean	**SD**	**mean**	**SD**
44.80	3.23	39.86	2.77
45.20	4.19	36.40	3.06
43.06	3.88	35.06	4.14
45.40	2.64	46.46	4.29

As Table 1 shows, the post test scores for ADHD symptoms have been decreased for the experimental groups as well as the control group.

Table 2. The Results of ANCOVA with Respect to Differences of Four Groups

Sources	df	Mean square	F	Sig	Eta^2	Observed power
Pretest	1	48.02	3.82	. 5	.06	.48
Group	3	353.68	28.19	.001	.60	1
Error	55	12.54	-	-	-	-

Results of Table 2 display a significant statistical difference between child based, family based and family-child based interventions and control group in relation to ADHD symptoms (P 0.000). The amount of training effect is 60% and the observed power shows that the volume of sample was adequate.

Discussion

The results of the study indicated that there is a significant difference between family based, child based and family-child based interventions among experimental groups and these experimental groups and control group as well.

In other words, these interventions in randomly assigned experimental groups as compared to control group decreased ADHD symptoms. The findings are consistent with studies of Macford and Barlow (2004), Mac- Mahon and Forhand (2003), Hooshvar et al., (2009), Hajebi et al., (2004), Farmer et al., (2002), Kazdin (2001), Froelich et al., (2002). Moreover, the results of the Tukey test showed that the most effective method was family-based intervention. To explain the results of the present study it could

be stated that the parents as the closest ones to the children play an important role in training and learning of children. Parents' training can decrease stress and tension of parents which leads to improvement of proper parent child relationship. This in turn leads to parents' understanding of their children's needs. Regarding the effectiveness of family-child based intervention, it seems clear that this type of intervention is significantly effective for parents who are still not ready to accept their children's problems. Since children are impressed by environment, especially by parents, therefore, parent training is an appropriate opportunity for parents to intervene their children's behavioral problems.

Table 3. Tukey test, comparison of mean scores of ADHD symptoms in experimental and control groups

Group I	Group J	Mean Difference (I-J)	Sig
Child based	Family based	3.46	0.05
	Family- child based	4.80	0.01
	Control	-6.60	0.01
family based	Child based	-3.64	0.05
	Family- child based	1.33	0.74
	Control	-10.06	0,01
family- child based	Child based	-4.80	0.01
	Family- child based	-1.33	0.74
	Control	-11.40	0.01
Control	Child based	6.60	0.01
	Family based	10.06	0.01
	Family- child based	11.40	0.01

The results of Table 3 display a significant difference between family based, child based and family-child based interventions and control group. Moreover, the results showed that among intervention methods, the most effective are the family based and family- child based intervention.

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Regarding the effectiveness of family-child based intervention, it seems clear that this type of intervention is significantly effective for parents who are still not ready to accept their children's problems. Since children are impressed by environment, especially by parents, therefore, parent training is an appropriate opportunity for parents to intervene their children's behavioral problems.

In summary, family-child based intervention, on one hand helps the child control, his behavior and on the other hand helps parents comprehend how to behave with their child. Therefore, both of these elements help improve child's ADHD symptoms. It is suggested that in future research, this comparison be done in other students with different grade levels.

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