

## Effects of Parent-Child Interaction Therapy on Behavioral Problems of Children with Attention Deficit/Hyperactivity Disorder in Iran

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### Abstract

**Background:** Attention-deficit/hyperactivity disorder (ADHD) is an important behavioral disorder that causes considerable individual and social difficulties, creating significant emotional distress for preschoolers and their caretakers. The present study aimed to investigate the effects of parent-child interaction therapy (PCIT) on behavioral problems of children with attention deficit/hyperactivity disorder in Ahvaz, Iran.

**Methods:** This was a pretest-posttest quasi-experimental study with an experimental and a control group. The statistical population comprised all children aged 5-12 years visiting psychology and psychiatry clinics in Ahvaz (Iran) in 2020 who were diagnosed with ADHD by specialists. A sample of 30 children was conveniently selected and randomly allocated to experimental and control groups (n= 15 per group). The research instrument was The Child Symptom Inventory (CSI-4). Analysis of covariance in SPSS-24 was used to analyze the data.

**Results:** In the post-test, the mean  $\pm$  standard deviation (SD) of ADHD signs and symptoms was  $28.33 \pm 4.65$  in the experimental group and  $32.67 \pm 3.65$  in the control group. The results showed that there was a significant difference between the experimental and control groups in the research variables (symptoms of attention-deficit/hyperactivity disorder, oppositional defiant disorder, generalized anxiety disorder, major depressive disorder, persistent depressive disorder, social anxiety disorder, and separation anxiety disorder) ( $P < 0.001$ ).

**Conclusion:** As the findings supported the effectiveness of PCIT on the behavioral problems of children with ADHD, workshops are recommended to be held on the treatment of behavioral problems in these children and their parents.

**Key Words:** Attention deficit disorder with hyperactivity, ADHD, Children, Parent-child relations, Problem behavior.

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## 1- INTRODUCTION

Children's mental disorders are divided into two groups with distinguishable characteristics based on a dimensional approach: externalizing disorders and internalizing disorders. Externalized problems include maladjusted problems and patterns occurring in opposition with other people and environments (1). These include outlaw and aggressive behaviors such as attention deficit/ hyperactivity disorder (ADHD), conduct disorder (CD), and oppositional defiant disorder (ODD). In contrast, internalizing disorders are of inward nature and manifested in social withdrawal, inhibition, anxiety, and depression. These disorders target the child's emotions, causing more harm and problems to children themselves than to the others (2). Moreover, internalizing disorders are associated with long periods of silence, disappointment, and somatization, which lead the child to experience shyness, fear, excessive attachment, and sorrow (3).

ADHD is one of the most common behavioral disorders in children, particularly at school age (4). Its symptoms are manifested in the first years of a child's life and continue to the end of childhood, adolescence, and in 70% of cases to adulthood. It is a neurodevelopmental disorder that is often described with impulsivity, inattention, and hyperactivity (5). According to the Diagnostic and Statistical Manual of Mental Disorders, the 5th edition (DSM-5), symptoms of ADHD must be present in at least social and academic settings, negatively impacting the activities to a degree that is inconsistent with the developmental level (6). In addition, symptoms do not occur exclusively during the course of pervasive developmental disorder (PDD), schizophrenia, and other psychotic disorders (7). Moreover, ADHD is an important behavioral disorder that causes considerable individual and social

difficulties, creating significant emotional distress for preschoolers and their caretakers (8).

Muñoz-Silva et al. (9) discovered that particular parenting styles could increase the severity of some of the symptoms of ADHD, for example, parents' high expectation of obedience from their children predicts the risk of hyperactivity. A study has shown that absence of parenting coordination in parents is highly associated with ADHD. Fathers' lacking responsive behaviors and mothers' lack of positive attention during the preschool years predict a higher level of inattention in childhood. Nonetheless, according to this study, interfering fathers lead to a higher level of ADHD combined type (10, 11).

Although medications are effective in reducing ADHD symptoms, parents may need to learn a behavioral strategy to help manage their children's behaviors. Training parents is a psychoeducational approach that teaches them effective behavioral-cognitive techniques to be used at home when confronted with the child's behavioral problems. These techniques are based on social learning rules, and aim to modify behavioral problems in the child's environment. Such changes in the child's environment, e.g., in the commands and consequences such as loss of a privilege lead to modifications in the child's behaviors (12, 13). Parent-child interaction therapy (PCIT) is an evidence-based effective treatment grounded in attachment and social learning theories. It is a combination of play therapy and parent behavioral training to modify the disruptive behaviors of children aged between 2 and 8; and its efficacy has been confirmed in treating behavioral problems (14). PCIT targets behavioral problems of young children by modifying the parents' behavior and parent-child interactions. Given that young children are not equipped with sufficient cognitive abilities

to identify and change problematic behaviors, this treatment first places emphasis on shaping the context instead of direct engagement with children (15). A PCIT program is administered in two treatment phases: child-directed interaction (CDI) and parent-directed interaction (PDI). Through the parent-child playing skills, the therapist provides required instructions to improve the quality of parent-child relationship attempting to increase the child's positive behaviors in the first phase and to increase positive parenting in the second phase (16-18). According to what was mentioned, the present study aimed to investigate the effectiveness of PCIT on behavioral problems of children with ADHD.

## 2- METHODS

### 2-1. Design and participants

This was a quasi-experimental pretest-posttest study with experimental and control groups. First, the researchers visited the heads of the specialized psychology and psychiatry clinics in Ahvaz (Iran) in 2020, and asked them to introduce children diagnosed with ADHD. In interviews with these children's parents, the existence of definitive symptoms of ADHD was checked. A sample of 30 eligible participants was selected and randomly allocated to experimental and control groups. In this study, we included 15 children with ADHD in each group by the use of G\*power software with an effect size of 1.61, a test power of 0.90, and  $\alpha=0.05$ . The experimental group received PCIT, while the control group received no intervention.

#### a) Inclusion and exclusion criteria

The inclusion criteria were scoring above the average on the Child Behavior Inventory (completed by the parents), age of 5-12 years, parents' signing the informed consent form for participation and not receiving other therapies simultaneously. The exclusion criteria

were the participants' unwillingness to fill out the questionnaire, missing more than two therapy sessions, or returning incomplete questionnaires.

#### b) Procedure

The participants were randomly allocated to the experimental and control groups. Before administering the interventions to the experimental group, the parents of children with ADHD filled out the questionnaires (pretest). The parents in the experimental group then received in-person and online PCIT by the researcher who had previously received specialized training on this therapy. The interventions were administered in twelve 60-minute sessions once a week. The control group was on the waiting list, and at the end of the study, to observe ethical considerations received a course of PCIT. The protocols for the PCIT are given in **Table 1**. After the interventions, the post-test was administered to the groups.

#### 2-2. Instruments

**The Child Symptom Inventory (CSI-4) - parent version:** The CSI-4 is a behavior rating scale developed based on DSM-3 classifications to screen 18 behavioral and emotional disorders in children aged 5 to 12 years. It was revised in 1994 based on DSM-4. This inventory has parent and teacher versions. The parent version has 112 questions designed for 11 major groups and an additional group of behavioral disorders, including ADHD, ODD, conduct disorder, generalized anxiety disorder, social phobia, separation anxiety disorder, obsessive-compulsive disorder (OCD), specific phobia, major depression, dysthymic disorder, schizophrenia, PDD, Asperger syndrome, facial and motor tics, post-traumatic stress disorder (PTSD), and bulimia (20). The items used in this study were related to eight subscales including AD/HD, ODD, CD, generalized anxiety disorder (GAD), major depressive disorder (MDD),

dysthymic disorder, social phobia, and separation anxiety. Farzad et al. (21) confirmed the reliability and validity of the

Persian version of this inventory. In the present study, Cronbach's alpha coefficient was estimated as 0.81.

**Table-1:** The contents of parent-child interaction therapy sessions (19)

Session	Content
1	Information about the children's past and current problems was collected through an interview, and the therapist got to know the parents and children.
2	Evaluation (interview, completing the questionnaires, observing the parent-child interaction)
3	Giving feedback to the families, familiarizing them with the structure of the therapy, answering their questions
4	Training child-directed interaction skills, explaining the objectives of child-directed interaction, giving assignments
5	Training child-directed interaction skills, explaining the "don't rules", modeling the "do rules", giving assignments
6	Training child-directed interaction skills, selective disregard, strategic attention, giving assignments
7	Training the integrated modeling of all the skills, leading parents' activities during role-modeling, giving assignments
8	Discussing the logic of the game, choosing toys at home, giving assignments
9	Answering parents' questions, explaining the use of obedience exercises, training effective directions
10	Training decision-making, discussing the outcomes of abiding the rules
11	The consequences of breaking the rules, providing complementary information about the time of deprivation
12	Directing and preparing the parents for modeling, concluding the sessions, answering questions

### 2-3. Data Analysis

The data were analyzed using descriptive (mean, standard deviation) and inferential statistics (univariate and multivariate analysis of covariance with Bonferroni post-hoc test, and the tests of its assumptions) in SPSS-24 at the significance level of  $\alpha=0.05$ .

### 3- RESULTS

The participants included 30 children with ADHD, aged  $8.13 \pm 2.54$  years old.

**Table 2** shows the pre- and posttest means and standard deviations (SD) of behavioral problems in children with ADHD in the experimental (PCIT) and control groups. According to the results, the means  $\pm$  SDs of the posttest scores of ADHD signs and symptoms were  $32.67 \pm 3.65$  in the control group and  $28.33 \pm 4.65$  in the experimental group.

The assumptions of the analysis of covariance (ANCOVA) were first checked. The pretest scores of behavioral

problems were regarded as the covariates, and the posttest scores as the dependent variables. The correlation coefficients between the pre and posttest scores were respectively 0.86, 0.59, 0.66, 0.53, 0.70, 0.70, 0.55, and 0.73 for the eight variables of ADHD signs and symptoms, ODD, CD, generalized anxiety disorder, major

depressive disorder, dysthymic disorder, social phobia, and separation anxiety. The linearity of the relationships between the covariates and the dependent variables was, thus, confirmed. As the correlation coefficients ranged from 0.01 to 0.50, the assumption of multicollinearity between the covariates was confirmed.

**Table-2:** Mean and SD of research variables in PCIT and control groups

Variables	Phases	PCIT	Control
		Mean± SD	Mean± SD
ADHD signs and symptoms	Pretest	32.07 ± 4.21	32.80 ± 3.52
	Posttest	28.33 ± 4.65	32.67 ± 3.65
Opposition and defiance	Pretest	15.47 ± 2.32	15.00 ± 1.92
	Posttest	10.80 ± 1.89	14.67 ± 1.71
Conduct disorder	Pretest	29.40 ± 3.37	28.87 ± 3.85
	Posttest	21.73 ± 3.93	28.27 ± 3.88
Generalized anxiety	Pretest	4.20 ± 1.08	4.60 ± 1.12
	Posttest	2.00 ± 0.92	4.53 ± 1.12
Major depression	Pretest	11.47 ± 1.72	12.47 ± 2.16
	Posttest	8.07 ± 1.66	12.00 ± 1.64
Dysthymic disorder	Pretest	14.27 ± 2.08	14.80 ± 1.74
	Posttest	10.87 ± 1.80	14.27 ± 1.58
Social phobia	Pretest	8.13 ± 1.22	7.73 ± 1.22
	Posttest	4.53 ± 1.18	7.33 ± 1.39
Separation anxiety	Pretest	14.47 ± 2.26	15.07 ± 2.31
	Posttest	10.07 ± 2.25	14.27 ± 2.08

PCIT: Parent-child interaction therapy; SD: Standard deviation

The results of Levene's test also confirmed the homogeneity of variances in the experimental and control groups on the pretest; therefore, the ANCOVA could be run. An ANCOVA was performed to examine the homogeneity of the regression line slopes and the group × pretest interaction. The results showed that the regression line slopes were non-significant on pre- and posttest in the groups. The group × dependent variable interaction was, therefore, not significant; thereby confirming the homogeneity of regression line slopes. Based on the MANCOVA, the groups significantly differed in at least one of the dependent variables ( $P < 0.001$ ).

**Table 3** presents the results of one-way analysis of covariance (ANCOVA) on the posttest scores of the dependent variables. These findings revealed a significant difference between the experimental and control groups in the ADHD signs and symptoms ( $F=36.33$ ,  $P= 0.001$ ), ODD ( $F=120.93$ ,  $P= 0.001$ ), CD ( $F=164.26$ ,  $P= 0.001$ ), generalized anxiety disorder ( $F=64.59$ ,  $P= 0.001$ ), major depressive disorder ( $F=65.22$ ,  $P= 0.001$ ), dysthymic disorder ( $F=90.34$ ,  $P= 0.001$ ), social phobia ( $F=96.14$ ,  $P= 0.001$ ), and separation anxiety ( $F=95.05$ ,  $P= 0.001$ ).

**Table-3:** Results of one-way analysis of covariance on posttest scores

Variables	SS	df	MS	F	P	$\eta^2$
ADHD signs and symptoms	90.86	1	90.86	36.33	0.001	0.64
Opposition and defiance	120.79	1	120.79	120.93	0.001	0.85
Conduct disorder	337.05	1	337.05	164.26	0.001	0.89
Generalized anxiety	29.30	1	29.30	64.59	0.001	0.76
Major depression	69.60	1	69.60	65.22	0.001	0.76
Dysthymic disorder	59.72	1	59.72	90.34	0.001	0.81
Social phobia	58.89	1	58.89	96.14	0.001	0.82
Separation anxiety	94.07	1	94.07	95.05	0.001	0.82

SS: Sum of squares; MS: Mean squares

#### 4- DISCUSSION

The present study aimed to investigate the effectiveness of PCIT on behavioral problems of children with ADHD in Ahvaz. The PCIT reduced the scores of behavioral problems in the children with ADHD in eight domains of ADHD signs and symptoms, ODD, CD, generalized anxiety disorder, major depressive disorder, dysthymic disorder, social phobia, and separation anxiety. These results are consistent with the findings of previous studies (22-24).

The parent-child interaction training program places emphasis on the influence of parents on the child. It provides the parents with the required information and addresses the concerns parents may have about their functioning in relation to their child with ADHD or their child's functioning in relation to them. In the light of the new information, the parents obtain a better understanding of their child (22, 23). In fact, PCIT follows a clear framework to guide the process of cultural adjustment. Accordingly, one of the goals of the training is encouraging parents to be actively engaged with interventions that reinforce family functioning, refine parenting styles, regulate feelings, and develop emotional status. Moreover, parents as the closest people to children have a major role in their training and learning. By improving parent-child relationship, the proper behavior of parents

enables them to understand the needs of their child better and play an effective and active role in helping manage their and their child's problems (24).

In general, it can be said that parenting is a role that has universal duties and its tensions involve all parents at a similar level. Having a child with behavioral problems is an additional issue that amplifies the concerns of all parents. Furthermore, parents who suffer from tensions because of different reasons could facilitate or extend the behavioral problems of their children (22). Thus, considering the results of previous studies, fixing children's problems by the people who are themselves in the cycle of concerns (i.e., parents) could modulate or impact this dysfunctional cycle, which will have multiple outcomes. Given that the treatment used in this study highlighted playing, which is the natural and inherent way of a child's communication with the surrounding world, it can positively influence all parents facing behavioral problems of children with ADHD or parents who want to improve their relationship with their children. Using playing as a communicative tool and taking the time to be with their children and play with them unconditionally are among the reasons that parent-child interaction treatment is effective in managing behavioral problems of children with ADHD. These play sessions are

designed to enhance the parents' acceptance of their children and make them able to empathize with them-qualities that most parents have problems with, being unable to see the world from their child's point of view (25). Therefore, playing is a great tool to improve parent-child relationship, and to help resolve the needs and conflicts of children. Such an efficacy also reduces the negative emotions of parents and the tensions associated with the role of parenting.

In addition, it could be argued that although a lot of the experiences with young children are filled with joy and pride for parents, in regard to the children with behavioral problems, the child's behaviors and the daily duties of parenting can be troubling, frustrating, or annoying, and cause numerous problems (26). The quality of mother-child relationship is one of the factors related to the behavioral problems of children. The quality of parent-child relationship could be defined by the feeling of parental openness, degree of openness, amount of communication, parent-child perceived conflict, feeling of parental rejection, parent-child antagonism/ aggression, the amount of parents' emotion expression, and the time spent with parents. How parents behave with their children has a crucial role in the formation of children's behavioral systems. The mother-child relationships such as rejection, overcontrol, patterning anxiety-related behaviors, and parents' illogical and stiff beliefs play a substantial role in the occurrence of behavioral problems in childhood. Studies have shown that the children who do not have a good parent-child relationship experience more sleep disorders, behavioral and adjustment problems, as well as externalizing disorders (27, 28).

Finally, it could be stated that children with ADHD have three main problems: attention deficit, hyperactivity, and diminished or impulsive control (9).

Attention deficit is determined by maintaining attention for a long period of time, particularly in doing boring or repetitive tasks, inability to focus and distraction, short attention span, and lack of attention to details. As another component of this disorder, hyperactivity is determined by nervousness and uneasiness, excessive talking, impatience, and agitation (27). It can be manifested in constant fidgeting and squirming while sitting. Hyperactive children show excessive running and jumping up and down at improper situations

#### **4-1. Limitations**

The most important limitation of this study was the lack of required knowledge and cooperation on the part of the participants in conducting research and completing online questionnaires. It is suggested that future studies use interviews for data collection in addition to questionnaires, and examine other variables related to PCIT.

#### **5- CONCLUSIONS**

Parent-child interaction therapy (PCIT) decreased ADHD signs and symptoms, ODD, CD, generalized anxiety disorder, major depressive disorder, dysthymic disorder, social phobia, and separation anxiety in children with ADHD. At the practical level, taking into account the effectiveness of the PCIT in decreasing ADHD signs and symptoms in children with ADHD, it is suggested to present PCIT to counselors and therapists in welfare centers to use this therapy method for children with ADHD.

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## 7- ETHICAL CONSIDERATIONS

The study was approved by the Ethical Committee of Islamic Azad University-Ahvaz Branch (code: IR.IAU.AHVAZ.REC.1399.116).

Moreover, the researchers received written consent from the parents of children for participation in the study. To observe ethical considerations, the control group received a course of PCIT, at the end of the study.

## 8- CONFLICT OF INTERESTS

None.

## 9- FUNDING/SUPPORT

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## 10- REFERENCES

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