The effectiveness of play therapy on symptoms of children with attention deficit – hyperactivity disorder

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Abstract

Attention deficit - hyperactivity disorder (ADHD) is associated with many problems and various methods have been proposed to treat children with this disorder. The present research was conducted to study the impact of play therapy on the symptoms of ADHD in children. A practical research is aimed here, as also an experimental method of pretest-posttest control group is applied. To this end, 24 children with ADHD (ranging from 5 to 12 years) who had been referred to Refah Counseling and Psychological Services Center were selected based on convenience sampling and consequently, with regard to the purpose of the study, were divided into two groups: control and experimental (12 subjects for the play therapy group and the rest for the control group). After the pre-test, the experimental group started the intervention program for 20 sessions (twice a week, with each session lasting 1 hour). Then, the posttest was done. Child Symptom Inventory (CSI-IV) was employed in order to perform pretest and posttest. Moreover, to evaluate the effectiveness of interventions in both groups, ANOVA was used. The results showed that play therapy has a positive effect on the symptoms of ADHD, as posttest scores were significantly lower than those of pretest. Overall, the findings suggest that behavioral symptoms of ADHD significantly decreased. Considering these results and those of other studies, we may conclude that play therapy can be used as an effective way of reducing the symptoms of children with ADHD in schools and medical centers.

Key words: play therapy, Attention Deficit -Hyperactivity disorder, children

Introduction

Attention Deficit- hyperactivity Disorder (ADHD) is one of the most common childhood disorders which has attracted the attention of psychiatrists and psychologists (1). It was first identified in 1845 by a German doctor named Henry Hoffman (2). Symptoms of ADHD in children include attention deficit (inability to focus and pay enough attention while performing tasks and daily activities), impulsivity - hyperactivity (a person is very active and does jobs without thinking) and the combined type (in this type of disorder, a person is very active and acts without thinking or concentration). It should be noted that children with ADHD show these symptoms inadvertently and quite unconsciously as they have no control over their behavior and actions. It is one of the most common
neurobehavioral disorders of childhood affecting a large proportion of the world population (3, 4). In fact, ADHD is the first or second most frequent disorder of childhood characterized by diversity and prevalence of three to five percent of school-age children and three to nine times more likely in boys than girls, as reported (5); besides, it may cause long-term adverse consequences, disrupting the process of development of mental abilities and social - emotional skills of a child. Hyperactivity - attention deficit is a complex disorder of brain and encompasses subtle abnormalities in the working of central nervous system (6). The cause of this disorder is unknown so far (7). The most recent studies suggest that both genetic factors and environmental factors, such as premature birth and smoking by mothers during pregnancy, are involved in this disorder (8). Meanwhile, documentary research implies neurological factors affecting attention deficit disorders. From 1930, abnormality in electroencephalogram (EEG) in people with ADHD has also been reported as a risk factor. EEG of such individuals indicates a high activity of slow theta waves in frontal and central regions of brain. In addition, the results of PET and SPECT reveal brain metabolic abnormalities associated with the central and frontal regions. In children with ADHD, a decrease in brain metabolism in the prefrontal region is seen (9, 10). In addition to their higher frequency EEG slow brainwaves, the lower activity of fast beta waves in such people is also significant. This indicates underarousal of the cerebral cortex in these patients (11, 12). Various treatment methods have been proposed for ADHD. One of the conventional treatments for children with ADHD is medication, such that about 75 percent of children are treated with stimulant drugs (13). The use of stimulant drugs to treat ADHD is ever increasing (14). And their effectiveness has been studied extensively. It should be noted that despite medication's benefits, according to experts and researchers, such drugs bring about many side effects for children, including: loss of appetite, weight loss, sleep disturbances, hallucination, depression, hypertension, and sadness or crying (15). In fact, drugs have a positive impact just a few hours after which the symptoms of ADHD return (16). Several psychological treatments are also adopted to help the affected people; one of these new treatments is called neurofeedback, which is a novel method employed to treat abnormalities. Neurofeedback is one of neuropsychological training and treatment techniques whereby, in a process of operant conditioning, a person can learn to alter his/her brain electrical activity (17). This method, using an instrument attached to the body, provides the patient with information about his/her body's biological functions (18). The basic idea is that brain, by observing its own abnormal waves, attempts for their improvements. This happens during the treatment process and is based on the principles of learning (19). Another method used to improve ADHD is play therapy (20). In fact, playing is a process in which a children find the opportunity to interact with their surrounding environment and, thus, to express their experiences, feelings, and thoughts (21). In other words, playing is the natural channel through which children express and assert themselves and so it should never be considered as time killing. Playing for children is the same as talking for adults. Also, play therapy is described as a dynamic interpersonal relationship, between the child and a trained therapist, during a process that facilitates the development of a secure connection for the child to fully express him/herself (22). In this way, children can learn and acquire their controlled skills better (23). Play therapy is a child's treatment technique that may be used to treat disorders of children. Although applications of play therapy for children has been highlighted in various articles, endeavors for measuring problematic behaviors and for protests aimed at amending them are rarely reported. Play therapy has in many cases been assessed to be effective as in the treatment of disorders such as children's depression and fears, behavioral problems rooted in anxiety, aggression, hyperactivity, and attention deficit (24). Play therapy is the best form of counseling intervention for children (25). Many of the techniques used in this area are derived from Neo-Freudian psychoanalysts like Anna Freud, Melanie Klein and others (26). There are many ways to do play therapy. Choosing a particular method is dependent on the context in which the intervention takes place as well as on the therapist's professional and theoretical perspective and the needs of the child: 1. unguided method: in which the child, and not the therapist, assumes the guidance; the therapist allows the child to set and direct the schedule, time, and goals of the play. 2. Guided method: whereby the therapist is the director; His activities are oriented towards shaping the schedule and doing the intervention, setting the goals and time of play therapy. This method is affected by direct interventions taken from cognitive behavioral therapy and social work practices. 3. Targeted method: all models of play therapy are partly focused on the goal, which in this case is performing the play by the child and the therapist in order to solve cases that are problematic for the child. 4. Cooperation method: the therapist uses both the guided and the unguided methods while both the
therapist and the child are capable of directing the program, setting the goals and timing the therapy. This procedure is based on speech therapy, methods of solution-focused therapy, and family therapy. Given the aforementioned information, it seems that play therapy is one of the effective methods for treating common disorders such as ADHD in children. In support of this idea, we may refer to the study of Naderi et al. (2010) who explored the effect of play therapy in reducing hyperactivity disorder, attention deficit, anxiety, and enhancing social development in children (27). Baggerly (2009) demonstrated that play therapy increases people's confidence and reduces their anxiety and depression (28). Furthermore, in another study, Shafer employed 15 play therapy techniques to treat and reduce the severity of symptoms of hyperactivity and attention deficit in children, 4 to 12 years of age, affected by ADHD (26). Drug therapy (especially through stimulant drugs) and methods of behavior therapy (self-directed training and parent education) are the most common treatment options for people with attention deficit – hyperactivity disorder (15). Although drug therapy has long been accepted and used as an effective treatment of this disorder, this issue is still much debatable (16). Besides, drugs cause various complications (1, 12). The positive effects of drugs last just a few hours, after which the symptoms of ADHD return (17). Behavioral therapy practices, also, have their own limitations and have been successful in about half of cases (18). Recent review studies in the field of play therapy have generally concluded that early studies are promising; however, because previous studies have methodological weaknesses, more rigorous and controlled scientific studies need to be carried out in this area (14). Considering the abovementioned circumstances and given the lack of comprehensive research in the field with respect to the effectiveness of play therapy in reducing attention deficit - hyperactivity, the present study aims to provide useful information on the efficacy of play therapy on symptoms of children with ADHD.

Materials and Methods

With regard to its nature and objectives, the present research is experimental and it is meant to produce practical results. Our study sample comprises 24 children (male and female and aged 5 to 12 years) with ADHD, identified with DSM-IV criteria, who were selected based on convenience sampling from the list of patients referred to Refah Counseling and Psychological Services Center during one month. To observe the moral considerations, we explained the process and objectives of the research as well as confidentiality of information to parents, who subsequently gave their full consent and were willing to cooperate in the implementation of the research. Additionally, parents were assured that no harm will be done to their children. After parents were informed about the clinical aims of the study, they completed the consent form. According to the purpose of the study, the 24 children were divided into the experimental and control groups (with 12 individuals in each group). After the desired sample was obtained, to do the pretest, Children-Symptom Inventory-4 (CSI-4) was distributed among parents who then filled it out. A week later, the experimental group began the intervention program for 20 sessions (twice a week, with each session lasting 1 hour) in the summer of 2015. One week after the last session of play therapy, posttest was administered as the pretest. At the end, parents and students were thanked for their sincere cooperation.

Children-Symptom Inventory-4 (CSI-4):

In the present study, we have used Child Symptom Inventory CSI-IV to determine mental disorders. The questionnaire is on the basis of DSM-IV diagnostic criteria and was drafted, in 1994, by Gadav and Sprafkin (Stony Brook University); it is the modified version of the previous questionnaires: CSI-3 and CSI-R3. There are two versions of this questionnaire: Parent Checklist and Teacher Checklist (29). Parent checklist, the one used here, contains 97 questions and assesses 17 disorders. Ererim (2009), using retest method, reported the reliability of the questionnaire to be 0.72 within an interval of 6 weeks and on 75 boys aged 6 to 10 years (30). In the study of Sooch (2009), it was observed that this questionnaire has a significant correlation with Achenbach Child Behavior Checklist and children's diagnostic questionnaire, which is a sign of its validity (31). In Iran, its reliability coefficient has been, using retest method, r=0.96 in the case of Parent Checklist (29). Tavakkolizadeh, Bolhari, Mehryar and Dezham (1996) employed retest method and reported the reliability of the Parent Checklist to be 0.85 (32). Soleimannejad (1997), using the same method, reported the reliability of the Parent Checklist to be 0.90 (33); moreover, Kalantari, Neshat, and Zareie (2001) notes that, using split-half method, this reliability was 0.85. Face validity of the questionnaire, which is based on DSM-IV diagnostic criteria, has been approved by the professors of psychiatry and psychology of Tehran Psychiatric Institute (34).

Play therapy program
In this research, the materials of the plays employed in various sessions were chosen using the guided approach, in a group and with regard to the relevant background, features of children affected by ADHD, experience of specialists, as well as three fundamental criteria:

1. Being qualified to fully engage children in terms of sense, movement, agreeableness, attention, and concentration.
2. Emphasis on the suitability of these techniques for children aged 5 to 12 years.
3. Being attractive, inexpensive, and easy to use.

The purpose was to reduce the severity of ADHD symptoms. Play therapy sessions, from the first to the tenth session, were as follows:

The first and eleventh sessions: the play of these sessions was navigation. Thus, the coach stands in front of students and, while moving around, asks them to run back and forth only in the direction to which he points. Students have to note that the direction in which the coach moves should not confuse them. Rather, they must match their moves only with the direction the coach points to. After a while, for variety's sake, the coach wants student to move in the opposite direction he points (purpose: increasing focus and attention).

The second and the twelfth sessions: the play of these sessions was "Search the voice!" whereby the class members stand around a circle; next, the coach chooses a child and closes his eyes using a tissue. The child then goes to the center of the circle. The coach gives the whistle to another student. The child in the center says "whistle!" and the one with the whistle proceeds accordingly (the voice of the whistle has to be in segment. The blind-folded student should accurately detect the direction of the sound so much that he can move to that side while asking for a second whistling, which is done. The one in the middle, this time, tries to approach the whistling person. He can ask for only one more whistling, after which, in case he manages to touch the whistle, they exchange their places. Otherwise, he should remain in the middle for a second round and the play goes on. If he still could not find the student who whistles, he would have to change his place with another child (purpose: improving concentration and attention).

The third and the thirteenth sessions: here, "walking on a balance beam" is played. Thus, children stand in a queue before the line drawn with colored chalk on the ground by the examiner; then, the first person moves as soon as the coach orders. In this game, each person moves alone until the end of the balance beam and does some of the following exercises as he desires:

1. Moving simply to the end of the balanced beam (while other students sing and clap).
2. While having his hands on his waist, he moves to the end of the beam.
3. Having his hands on his chest, he walks to the end of the beam.
4. Clasping his hands behind his body, he walks.
5. While the play is carried out, students can make it more attractive by singing favorite songs (the goal: improving concentration and attention).

The fourth and the fourteenth sessions: in this session, "Hit and Falls" is played. That is, a square with side length of 3 meters as well as a circle inside it with one meter diameter are drawn. A cylindrical object is placed in the center of the circle and players try to make the wooden cylinder fall down by throwing a ball toward it. The child who manages to throw the stick is the only person entitled to go inside the circle and put the cylindrical object in place again.

- Players must throw the ball and take turns as the coach commands them.
- This game is played 2 or 3 times (the goal: enhancing concentration, attention, and patience).

The fifth and the fifteenth sessions: the game "I'm the next one" was played. Thus, the coach invites a number of children, in a queue, to an open area and tells them if any of them were asked to carry out some action, the next one is obliged to implement it. Because there is nobody next to the last person, it is the first student who has to do what is required of the last child in the queue. Any mistake would send the one who made it to the end of the queue (purpose: enhancing spatial visualization, patience, concentration and attention).

The sixth and the sixteenth sessions: The game was "Jump in the river": two parallel lines with a distance of one and a half meter are drawn. A cylindrical object is placed in the center of the circle and players try to make the wooden cylinder fall down by throwing a ball toward it. The child who manages to throw the stick is the only person entitled to go inside the circle and put the cylindrical object in place again.

The seventh and the seventeenth sessions: in these sessions "Simon" was played, such that one of the players is chosen by lot as the leader and the game begins. The leader says: "I say hands behind the waist" and the rest act accordingly. As far as the
leader says "I say," others have to imitate whatever is ordered. If the leader omits this part of each sentence (i.e. "I say"), players should not respond. The person who has made the fewest mistakes will resume the game as the new leader (purpose: reducing impulsive behaviors).

The eighth and the eighteenth sessions: the game of these sessions was "One, two, ready!" Thus, two parallel lines with a distance of 10 meters are drawn on the ground, and children stand behind one of the lines waiting to hear the leader command. Together they shout "one, two" and the guide, in response, orders them to fasten their shoelaces; then, children answer "three, four" and the guide says "get ready!" which is followed by "five, six" from children; next, the guide says "run, or you'll be late!" after hearing this, children run toward the opposite line and when they cross it they come back to the first line. The one who first crosses the initial line becomes the new leader and the game continues accordingly. The guide has to be careful about how he says "run, or you'll be late!" That is, it should be stated slowly or quickly so that children would wait to hear "you'll be late!" and not move before hearing it. In these sessions, a combination of earlier games was performed (purpose: reducing impulsive behaviors).

The ninth and the nineteenth sessions: here, "Stand up. sit down" was played. Students stand in a queue in the playground. The coach gives orders such as "sit down," "stand up," "don't sit," and "don't stand" and students abide by them. If someone does other than what is ordered, he fails and so has to go to the end of the queue. It should be mentioned that "don't sit" denotes the standing posture and "don't stand" refers to the act of sitting down (purpose: reducing impulsive behaviors).

The tenth and the twentieth sessions: "Snake, snare" is the name of the game played here. Children stand in two opposite queues with a distance of approximately 10 meters. The coach calls one group "snake" and the other "snare." Children of the two groups have to remember these names. As the play begins, the coach calls the name of a group loudly and clearly. For example, he should first utter "sn" which is common between the two groups; then, he would utter either "ake" or "are" upon which the respective group has to run away and the other group has to chase it. Anyone who is touched by another child of the opposite group has to leave the game. This process continues until one person is left. This play can also be done by other similar pair words. The subjects have to repeat earlier plays as well (purpose: reducing impulsive behaviors).

### Statistical method

To analyze the collected raw data, we use descriptive and inferential statistics. Descriptive statistics is used to measure the index of central tendency and dispersions, as well as to draw graphs and tables for the collected data. Concerning referential statistics, to compare the two groups, all variables were analyzed in terms of data normality using Kolmogorov-Smirnov (K-S) test. Then, since the three variables of inattention, hyperactivity, and impulsivity had been measured for the two groups before and after the intervention, ANOVA statistical model was used so as to compare the two groups. Significance level for the test analyses was $P \leq 0.05$. Furthermore, MATLAB software was used to draw diagrams.

### Results

The study sample consisted of 24 subjects (male and female) aged 5 to 12 years. In order to be placed randomly in the experimental and control groups, they were assessed in terms of age, weight, and height (Table 1) ($P \geq 0.05$). Besides, after the tests, data were collected and analyzed in descriptive and inferential statistics; such that, regarding descriptive statistics we used frequency tables, mean, and standard deviation; and with respect to inferential statistics, ANOVA was performed to compare and examine group differences in pretest and posttest.

<table>
<thead>
<tr>
<th>Variable</th>
<th>treatment group</th>
<th>experimental group</th>
<th>control group</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>9.73±1.75</td>
<td>9.20±1.89</td>
<td>0.43</td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>27.66±4.87</td>
<td>28.00±4.67</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>Height (cm)</td>
<td>130.7±8.23</td>
<td>128.7±7.99</td>
<td>0.51</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 shows that the subjects are not significantly different from one another in terms of statistics, which implies that randomization has been carried out properly ($P \geq 0.05$).
As indicated in Table 2, there is no significant difference between pretest scores in the experimental and control groups, while the average posttest scores reveal a clear difference between the two groups. In the experimental group, a decrease in posttest score can be observed and the average has declined from 18.20 to 12.99. Hence, the intervention program has been effective in mitigating the symptoms of children with ADHD.

Table 2. Descriptive analysis of pretest and posttest scores of the two groups

<table>
<thead>
<tr>
<th>Statistical indexes</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean</td>
<td>SD</td>
</tr>
<tr>
<td>experiment</td>
<td>18.20</td>
<td>9.254</td>
</tr>
<tr>
<td>control</td>
<td>18.30</td>
<td>9.212</td>
</tr>
<tr>
<td>total sample</td>
<td>18.25</td>
<td>9.233</td>
</tr>
</tbody>
</table>

The twenty-session intervention program caused a significant difference in ADHD in the experimental group. In other words, the intervention program of play therapy triggered a significant reduction in the symptoms of attention deficit, hyperactivity, and impulsivity disorder among the subjects of the experimental group (P<0.05). As indicated in Table 2, the severity of the types of this disorder (as seen by parents) decreased in the intervention group after the play therapy program. However, this amount did not change significantly in the case of the control group.

Table 3. The mean and standard deviation of attention deficit, hyperactivity, and impulsivity disorder among experimental and control groups in pretest and posttest based on covariance (as related by parents)

<table>
<thead>
<tr>
<th>Disorder report of</th>
<th>Disorder type</th>
<th>Experimental group</th>
<th>Control group</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pretest</td>
<td>posttest</td>
<td>pretest</td>
<td>posttest</td>
</tr>
<tr>
<td>parents</td>
<td>attention deficit</td>
<td>16.44±1.10</td>
<td>8.40±1.29</td>
<td>16.47±1.44</td>
</tr>
<tr>
<td>parents</td>
<td>hyperactivity</td>
<td>26.14±2.22</td>
<td>16.17±13.44</td>
<td>22.80±1.30</td>
</tr>
<tr>
<td>parents</td>
<td>impulsivity</td>
<td>7.00±0.79</td>
<td>2.50±0.64</td>
<td>7.20±0.82</td>
</tr>
</tbody>
</table>

*Significance level: P<0.05

Discussion and conclusion

This study was conducted to examine the effectiveness of play therapy on symptoms of attention deficit - hyperactivity in children aged 5 to 12 years. The results showed that there is a significant difference in the experimental group in the interval between the pretest and posttest; that is, the subjects of this group got over in terms of ADHD while those in the control group, excluded from the intervention program, revealed no significant improvement. Blinn, in his doctoral thesis, explored the impact of cognitive-behavioral play therapy on solving problems of children with ADHD. Performing the pretest and posttest, and using Conners' Parent. Teacher Rating Scale, daily problems rating scale for target behaviors, as well as interval registration papers, the study of Blinn assessed, over a period of 7 months, the Outcome of play therapy on individuals affected by ADHD over a period of 7 months (36). The results this study are consistent with those of Blinn, despite the use of different questionnaires involved. It turned out that play therapy continues to exert its effect, even if other measuring tools are applied. The study of Panksepp et al., conducted on mice with frontal lobe damage modeled on ADHD in humans, demonstrated that without playing, self-control, and other administrative executive functions they do not grow properly. In fact, physical plays reduce excessive playfulness and impulsivity of mice with frontal lobe damage (37). The present study extends the results of Panksepp et al. to be applicable to humans. Also Nader et al. (2010) observed the effect of play therapy in reducing hyperactivity, attention deficit disorder, anxiety, as well as in enhancing social development in children (38). Jannatiyan, Nouri, Shafati, Molavi, and Samavatian (2008), adopting a cognitive-behavioral approach, dealt with the impact of play therapy on the severity of symptoms of ADHD in male students aged 9 to 11 years. They concluded that play therapy, during the posttest, caused a significant reduction in the intensity of the respective symptoms (P<0.001) (39).
Similarly, Nazer et al. (2014) studied the impact of sports therapy on symptoms of hyperactivity. Inattention disorder among elementary school students in Rafsanjan. Their results exhibited a significant decrease in hyperactivity, impulsivity, and inattention in the experimental group; something which was noticeable even during the follow-up (40). The results of the studies of Jannatiyan et al. and Nazer et al. are in line with the present research. Remarkably, Moore benefited from a type of eye exercise, similar to a play, to enhance the attention of children affected by ADHD. This study suggested that impulsivity of the eyes of these children decreases over time (41). Moreover, the results of the present study indicated that play therapy, like eye exercise, helps reduce the symptoms of attention deficit. These findings are a reminder that play therapy is effective and parents may prefer behavioral-kinetic therapies over pure drug treatments. Since centers such as preschools and kindergartens feature a higher frequency of ADHD patients, it is of utmost importance to design programs drawing on play therapy for children with this condition. Specifically, such plays ought to be designed in such a way that non-affected children, too, may be able to participate and enjoy them. On the other hand, this kind of therapeutic approach may also be used in special clinics for children with ADHD. Hence, according to the results of this research and other studies, it is recommended that psychiatrists and clinical psychologists take advantage of play therapy, alongside medical treatments, to remedy children with ADHD. Also, parents should be aware of this method so that, by engaging their children in regular motor activities, they may help ameliorate attention deficit-hyperactivity in their children. At the end, it is hoped that this research will pave the way for future work in this field, contribute to the knowledge in the area of physical education, sports science, as well as rehabilitation, and its positive effects become known to all people, children in particular. It is proposed that similar research with a different kind of exercise protocols and different age groups be carried out on other behavioral disorders so that one is able to state the results more generally.

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Conflict of interest

The authors declare no conflict of interest

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