



Published by DiscoverSys

A comparative study of effectiveness of medicinal therapy and combined therapy (cognitive-behavioral and drug) of students diagnosed with Attention Deficit Hyperactivity Disorder (ADHD)



CrossMark

Monireh Haji Aghae, ^{1*} Morteza Tarkhan ²

ABSTRACT

Attention Deficit Hyperactivity Disorder (ADHD) is a prevalent disorder affecting 5-10% of children. ADHD is particularly characterized in the start of primary school, making some educational, behavioral, and social problems for the individuals and families. Therefore, this article aimed to study the effectiveness of two methods, drug therapy and combined therapy (cognitive-behavioral and drug). The statistical population consisted of 176 male students aged 7-13 referred to the Consultation Committee in 2015. A total of 45 students diagnosed with ADHD were enrolled as the sample using the convenience sampling method. Data were collected using psychiatric diagnostic interviews and CSI-4 Questionnaires. The students were randomly divided into three 15-member groups. Pretests were employed

before any treatment. The independent variable was therapy held in 10 sessions. The dependent variable was ADHD symptoms. The first group underwent drug therapy using Ritalin prescribed by the physician. The second group received combined therapy (Ritalin and cognitive-behavioral therapy (CBT)) using training. Control group had no treatment. A week after treatment, posttest was carried out. The data were analyzed using covariance, ANOVA, and LA-Metric post hoc tests. The results showed that drug and combined therapy were effective ($P < 0.01$ and $F_{1,41} = 118.313$). LA-Metric post hoc test showed that both drug therapy ($P < 0.01$) and combined therapy ($P < 0.01$) had a significant relationship with the control group. Drug therapy had no significant relationship with the combined therapy ($P > 0.05$).

Keywords: Drug Therapy, Combined Therapy (Drug and Cognitive-Behavioral), Attention Deficit Hyperactivity Disorder (ADHD)

Cite This Article: Aghae MH. 2017. A comparative study of effectiveness of medicinal therapy and combined therapy (cognitive-behavioral and drug) of students diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). *Bali Medical Journal* 6(1): 82-89. DOI:10.15562/bmj.v6i1.461

¹MA of Psychology, Islamic Azad University of Tonekabon, Tonekabon, Iran

²Associate Professor, Department of Psychology, Payame Noor University, Tehran, Iran

INTRODUCTION

ADHD is one of the most common childhood disorders characterized by more visiting of health centers than other disorders. Today, ADHD has interested scientists and researchers for different reasons. First off, ADHD is first or second frequent disorder in childhood and adolescence, creating problems for students. It affects cognitive, social, emotional, and family performance and also career and marital performance in adulthood. Second, the etiology and treatment of this disorder are still not fully understood. Third, it seems that better understanding of ADHD helps a better understanding of many other comorbid disorders such as conduct disorder, oppositional disorder, and learning disability.¹ The diversity of ADHD terminology indicates that scientists look at ADHD differently, each focusing on one dimension. For example, in the 60s and 70s, it was known as a neuropsychiatric disorder caused by mild brain dysfunction. It used to be treated by psychostimulant drugs such as amphetamines. In the following years, therapists and researchers realized some attention problems in children and found out that "attention deficit" is more than hyperactivity in children. Therefore, the

American Psychiatric Association (1980) selected ADHD for the disorder.² Abykof et al. (1996), quoted by Tizdast (2006), concluded that although cognitive training has positive and dramatic aspects, findings do not approve usefulness.³ Teeter (1998) believed that self-training enhanced performance of children diagnosed with ADHD.⁴ The study by Alizadeh and Andries (2002) showed that a mutual relationship was found between authoritative and authoritarian parenting style for children diagnosed with ADHD.⁵ Another finding of this study also showed that the parents of children with ADHD were not similar concerning using authoritative and authoritarian parenting style for males and females. Another study by Biederman et al. (2004) showed that the ADHD children are exposed to executive function deficiencies (EFDs).⁶ Bridgett and Walker (2006) compared adults diagnosed with ADHD and normal individuals concerning intelligence using WAIS. They concluded that functional intelligence of individuals with ADHD was lower than normal individuals. The difference was not, however, significant.⁷ Two other studies showed that the disorder is largely heritable, accounting for 75% of ADHD

*Correspondence to: Monireh Haji Aghae, MA of Psychology, Islamic Azad University of Tonekabon, Tonekabon, Iran
global.conference.t@gmail.com

cases. Therefore, it is a genetic disorder.⁸ Researchers believe that ADHD is caused by a series of genes. Most of these genes transfer dopamine.⁹ The study by Chang, Davies, and Gavin (2009) on ADHD students showed that such students make mistake in self-monitoring behaviors caused by processing failures in brain.¹⁰ Longley (2009) studied the increased risk of sudden death in children with ADHD who were taking Ritalin. They concluded that these children are more than seven times at risk of sudden death.¹¹ Findings showed that self-control practices reduce the incidence of inappropriate behavior and lead to enhanced performance. Self-reinforcing and self-assessment practices were effective in creating, continuing, and changing student behaviors diagnosed with behavioral disorders.¹² Diversity, frequency, and chronic behavioral problems associated with ADHD highlight the supply of different health services in different health situations by clinical specialists. This requires the intervention of specialists in other fields including physician, psychologist, social worker, and trainers in order to apply their skills to deal with the problems. Therefore, it is essential to set professional conflicts aside in order to be able to supply necessary services for the child and his/her family. As discussed earlier, there is no treatment for ADHD. Even the most effective existing treatments are short-term ones. Understanding the etiology of this disorder, even little, helps the selection of treatment. Yet, new evidence suggests that long-term multimodal therapy reduces risk in adolescents and adults.¹³ So far, three general therapeutic approaches have the experiential support: drug therapy, behavioral therapy, and combined therapy (drug+ psychological therapy). Short-term effectiveness of these interventions has been proven; however, the continuity of the medical effects has not been reported. Drug therapy is the most common ADHD intervention. Stimulants such as methylphenidate (Ritalin) are the most common drug in this regard. Research has verified the effect of stimulants on disorder symptom reduction. Studies investigated the effect of stimulants on secondary disorder symptoms such as academic performance and various social behavior aspects. They have not reported optimal results compared to the effect of drugs. Unlike the positive and optimal effects of stimulants, there are certain shortcomings including ineffectiveness for all children, lack of long-term effects, and complications.¹⁴ The term "CBT" was first used in the scientific literature of the mid-1970s. The results of the first controlled medical tests were released in closing years of the decade. A little after a while, CBT was a leading psychotherapy in most western countries (Taj, 2005). According to the definition by the British Association for Behavioral & Cognitive

Psychotherapies, "CBT covers a range of treatments based on the concepts and principles derived from psychological models of human emotions and behaviors. These methods include a variety of treatment approaches." Three different CBT approaches, regularly applied by mental health professionals, are rational emotive therapy, multifaceted psychotherapy, and cognitive therapy.¹² Among the studies supporting the effectiveness of psychotherapy in reduced hyperactivity symptoms and increased attention in children diagnosed with ADHD, the following studies can be pointed out: Ashatri Zadeh (2003): The Effect of Self-Monitoring Strategy Training;¹⁶ Jafari (2002): Relaxation Therapy;¹⁷ Reza Zadeh (2004): The Effect of Concentration Games; and Hassan Zadeh Namin (2005): Impulse Control Training. Rasouli et al. (2013) studied "the effectiveness of cognitive-behavioral training of mothers on reduced ADHD symptoms followed by father's happiness." The results showed that although drug therapy was effective in reducing mother's symptoms and increasing happiness, adding "training" variable enhanced the effectiveness. Happiness was found to be transient to fathers who were not present in training sessions.¹⁸

Zareiee (2000) realized that both parents' behavioral training and drug therapy in the follow-up stage reduced hyperactivity symptoms of the subjects. On the other hand, they were almost equally effective and were not significantly different.¹⁹

Tizdast et al. (2006) studied "the effectiveness of behavioral therapy, cognitive therapy, drug therapy, and combined therapy on ADHD." They concluded that drug therapy and combined therapy were both effective in reducing ADHD symptoms. However, they were not superior to each other.³

The study by Seidan and Abdullah Pour (2014), aiming to introduce traditional medicine, the use of medicinal plants and chemical drugs, and CBT to treat ADHD, claimed that since the effectiveness of mentioned medicines was verified in nerve system disorders as well as sedative properties, they might be the best medicinal approach to improve children's psychological problems.²⁰

Borj Ali et al. (2014) compared the Adler-based encouragement training method, Barkley theory-based behavioral training, and drug therapy on self-controlling skills of children diagnosed with ADHD. They concluded that Adler-based parents' encouragement training method and parents' Barkley theory-based behavioral training method increased the children's self-controlling skills diagnosed with ADHD.²¹

Hassan Abadi et al. (2011) claimed that although CBT and drug therapy were both effective in reducing ADHD symptoms, CBT was found to be more effective.²²

Hakim Javadi et al. (2015) compared the effect of behavioral therapy, drug therapy, and combined therapy on reduced ADHD symptoms. The results showed that drug therapy and combined therapy had similar effects on reduced ADHD symptoms.²³

Kevin et al. (2014) studied the CBT in hyperactive adolescents. The intervention in this study was derived from adult's ADHD plan which had resistance symptoms to drugs. The results caused some changes in the dosages, parents' ranking concerning the medication adherence, adolescents' self-reporting of personal compatibility, teacher-parents ranking about the attention deficit, presence in school, late arrival to school, parents' reports in terms of peers, family and academic performance, and teacher's reports concerning the relationship with teacher, academic performance, and adolescent's self-esteem. According to the teacher-parents assessment, adolescents diagnosed with ADHD benefit less in oppositional defiant disorder rather than CBT intervention. According to the teacher-parents assessment, adolescents diagnosed with ADHD and concurrent depression/anxiety disorders benefit more from CBT intervention. Therefore, CBT protocol derived from adult's ADHD therapy plan can be useful for adolescents diagnosed with ADHD.²⁴

The study by Sanogo Barack et al. (2013) concerning the non-drug interventions (diet therapy and psychotherapy) for ADHD showed that all diets and non-drug interventions had significant results.²⁵

Prasad et al. (2012) investigated the effectiveness of drug therapy in assignment behavior and academic performance improvement in a systematic and meta-analysis study among the children diagnosed with ADHD. In this study, they studied the effect of methylphenidate, amphetamine salts, and atomoxetine compounds and compared with three groups: Group I who did not receive drug, baseline, and placebo. The results showed that drug therapy was effective in improving assignment behavior and academic performance improvement.²⁶

Emilson et al. (2011) investigated the CBT in adults diagnosed with ADHD with resistance symptoms using drug. Findings showed moderate-to-high effects on ADHD symptoms, which dramatically improved in a 3-month follow-up period. Other concurrent problems were significantly improved in the follow-ups. Findings supported the hyperactive adults and youth reasoning and rehabilitation programs in reducing ADHD symptoms and concurrent problems, which improved the related performance. The argument about the usefulness of "reasoning

and rehabilitation programs for hyperactive youth and adults" is multifaceted. The combination of drug-psychotherapy and CBT improved drug interventions.²⁷

Rigs et al. (2011) studied 303 adolescents diagnosed with ADHD and substance use disorder (SUD) undergoing CBT along with OROS-MPH and compared with CBT control and placebo groups. No significant difference was found concerning the clinical degree for ADHD and reduced number of substance consumption days. The secondary results were successful for osmotic methylphenidate. Parents' reports were lower in the 8th and 16th weeks for ADHD Clinical Rating Scale.²⁸ The number of negative urine kits was more compared with placebo concerning the osmotic methylphenidate. The results showed that combined therapy (CBT and osmotic methylphenidate) was not more effective than CBT-placebo for ADHD. However, drug therapy improved ADHD's secondary clinical assessments and substance consumption. The hypotheses outlined here are as follows:

- Are CBT and drug therapy more effective than drug therapy in ADHD clinical symptoms?
- Do clinical symptoms reduce more in students diagnosed with ADHD receiving drugs compared to those who did not receive the drug?
- Do clinical symptoms reduce more in students diagnosed with ADHD receiving combined therapy compared to those who did not receive the therapy?

METHOD

This is a quasi-experimental test using pretest-posttest and control groups. A total of 56 out of 176 students visiting the Consultation Committee were enrolled as the sample based on psychiatric interviews, DSM-IV criteria, and Child Symptom Inventory (CSI-4), and Group A Parents' questions (18 items). Group A obtained scores greater than 6 in all questions related to this. Therefore, they were identified as ADHD cases. A total of 45 male students aged 7-13 were randomly and equally divided into three groups. 15 students underwent drug therapy and 15 experienced combined drug therapy and CBT. The rest (15 students) were considered control group.

CSI-4, self-training CBT (Table 1), and drug therapy using Ritalin were employed.

Child Symptom Inventory (CSI-4)

The Child Symptom Inventory-4 (CSI-4) is a behavior rating scale that screens for DSM-IV. Scoring is done

according to two ways: symptom count cutoff scores and symptom severity. Most studies adopt the former method. Symptom severity is more reliable concerning clinical efficiency. The count cutoff score is obtained from the total sum of some terms responded by "often" or "mostly" except for cases which will be indicated later. Then, the total score is compared with symptom severity score derived from DSM-IV diagnostic criteria. If the score equals or is greater than the symptom severity score, screening score would be "yes" and the subject is qualified for the disorder. Otherwise, for the scores lower than symptom severity score, the number of symptoms is positively assessed by teachers, parents, and so forth, where scores greater than the threshold are considered disorder and lower scores are lack of disorder. The reliability was determined by retest for four diagnostic groups ranging from 70% to 89% (Gadow and Sprafkin, 1994). Most studies focused on CSI-3R. Since there are minor differences between CSI-3R and CSI-4R, most findings derived from CSI-3R can be generalized to the new form.³ Self-training-based CBT was performed in 10–45-minute sessions, twice a week as shown in Table 1.

Findings

The following tables report mean and standard deviation of pretest, posttest, and moderated ADHD clinical symptoms of drug therapy, combined therapy, and control groups.

As it can be seen, the mean and standard deviation reduced in posttest stage compared with the pretest stage.

Table 2 Mean and standard deviation of ADHD clinical symptoms

Variable	Group	N	M	SD
ADHD clinical symptoms	Combined (CBT+ drug)	15	44.67	1.839
	CBT	15	43.87	1.187
	Control	15	44.20	0.884

Table 3 Posttest mean and standard deviation of ADHD clinical symptoms

Variable	Group	N	M	SD
ADHD clinical symptoms	Combined (CBT+ drug)	15	39.13	1.187
	CBT	15	39.47	1.187
	Control	15	43.07	0.884

Main Hypothesis. Combined therapy (CBT and drug) is more effective in reducing ADHD clinical symptoms than drug therapy.

According to the results of the above table for ADHD clinical symptoms, since alpha is less than 0.01, F is statistically significant. At 99% confidence, we claim that drug therapy, CBT, and combined therapy were effective in reducing ADHD clinical symptoms.

$$F_{(1,41)} = 89.786, P < 0.01.$$

Since the mean differences are significant at 99% probability, the following hypothesis is verified:

ADHD clinical symptoms reduced more in students who received drug therapy than those who did not receive. According to the mean difference comparison, drug therapy is more effective in reducing ADHD symptoms than control group.

$$F_{2,41} = 70.948; P < 0.01 \text{ and partial } \eta^2 = 0.776.$$

Since F is statistically significant, the mean difference of ADHD clinical symptoms was compared in drug therapy, combined therapy, and CBT using La-Metrics post hoc test in order to clarify which group is the most effective in reducing ADHD clinical symptoms. Table 6 shows the results.

According to the results of Table 6 for ADHD clinical symptoms, since significance level ($P=0.135$) is greater than the significance level of ($P=0.01$) considering $F_{(1,41)} = 2.322$, F is not statistically significant. Therefore, it is claimed that ADHD clinical symptom posttest scores were not significantly

Table 1 Stages of CBT (Seif, 1994)

Session	Treatment plan
1	Initial interviews and activities related to collaboration and positive relationships
2	ADHD training and information and the logic of treatment
3	The logic of muscle relaxation and the first stage, assignment completion by therapist and interviews with loud voice
4	2 nd stage of muscle relation (diagram completion) by authorities and therapist's order with loud voice, homework
5	3 rd stage of assignment, paying attention to details, homework
6	4 th stage of muscle relaxation, maze task, whispering to himself while doing homework, homework
7	Complete muscle relaxation, assignment with whispering, homework
8	Fast and complete muscle relaxation by therapist and repetition, homework review, success encouragement
9	Repeating previous session, daily planning learning, daily homework, and thinking about the orders to himself
10	Fast muscle relaxation, homework review; the child thinks about the orders and repeats to himself, success encouragement

Table 4 Moderated mean and standard deviation of ADHD clinical symptoms

Variable	Group	N	M	SD
ADHD clinical symptoms	Combined (CBT+ drug)	15	39.987	0.296
	CBT	15	39.572	0.266
	Control	15	43.109	0.264

Table 5 Covariance analysis of effectiveness of drug, combined, and control therapy on dependent variable (ADHD clinical symptoms)

Variable	SS	df	MS	F	Sig	η^2
ADHD clinical symptom intergroup	147.723	1	73.862	70.948	0.005	0.776
ADHD clinical symptom in-group	42.684	41	1.041			

Table 6 Covariance analysis of effectiveness of drug, combined, and control therapy on dependent variable (ADHD clinical symptoms)

Variable	SS	df	MS	F	Sig	η^2
ADHD clinical symptom intergroup	2.418	1	2.418	2.322	0.135	-0.585
ADHD clinical symptom in-group	42.684	41	1.041			

Table 7 Covariance analysis of effectiveness of drug therapy, compared to control group on dependent variable (ADHD clinical symptoms)

Variable	SS	df	MS	F	Sig	η^2
ADHD clinical symptom intergroup	93.473	1	93.473	89.786	0.005	-3.573
ADHD clinical symptom in-group	42.684	41	1.041			

Table 8 Covariance analysis of effectiveness of combined therapy compared to control group on dependent variable (ADHD clinical symptoms)

Variable	SS	df	MS	F	Sig	η^2
ADHD clinical symptom intergroup	123.171	1	123.171	118.313	0.005	-4.122
ADHD clinical symptom in-group	42.684	41				

different in drug therapy group and combined therapy group. The result showed that the effectiveness of combined therapy was not more than drug therapy in reducing ADHD clinical symptoms. The effect of combined therapy was not more than drug

therapy. The effect of combined therapy was found to be similar to drug therapy.

$$F_{(1, 41)} = 2.322; P > 0.05.$$

Since mean differences were significant, at 95% confidence, it is claimed that the hypothesis “combined therapy was more effective than drug therapy” was not verified.

First Secondary Hypothesis. Clinical symptoms of students diagnosed with ADHD who received drug reduced more than those who did not.

According to the results of Table 7 for ADHD clinical symptoms, since significance level ($P=0.0005$) is less than the significance level of ($P=0.01$) considering $F_{(1, 41)} = 89.786$, F is statistically significant. Therefore, it is claimed that ADHD clinical symptom posttest scores were significantly different in drug therapy group and control group. Comparing the ADHD clinical symptom mean difference in two drug therapy groups with control group showed that a difference was found between the ADHD clinical symptom mean scores of drug therapy group and control group by -3.537 , which is statistically significant at 0.01 level, showing that drug therapy was more effective in reducing ADHD symptoms than the control group.

$$F_{(1, 41)} = 89.786, P < 0.01.$$

Since the mean differences are significant at 99% probability, the following hypothesis is verified:

ADHD clinical symptoms reduced more in students who received drug therapy than those who did not receive. According to the mean difference comparison, drug therapy is more effective in reducing ADHD symptoms than the control group.

Second Secondary Hypothesis. The clinical symptoms of students diagnosed with ADHD who received combined therapy (drug + CBT) reduced more compared to those who did not.

According to the results of Table 8 for ADHD, since significance level ($P=0.0005$) is less than the significance level of $P=0.01$ considering $F_{(1, 41)} = 118.313$, F is statistically significant. Therefore, it is claimed that ADHD posttest scores were significantly different in combined therapy group and control group. Comparing the ADHD mean difference in combined and CBT groups with control group showed that a difference was found between the ADHD mean scores of combined and CBT groups with control group by -4.122 , which is statistically significant at 0.01 level, showing that

combined therapy was more effective in reducing ADHD symptoms than the control group.

$$F_{(1,41)} = 118.313, P < 0.01.$$

Since the mean differences are significant at 99% probability, the following hypothesis is verified:

ADHD symptoms reduced more in students who received combined therapy than those who did not receive. According to the mean difference comparison, combining drug and CBT therapy is more effective in reducing ADHD symptoms than control group.

DISCUSSION AND CONCLUSION

This article aimed to study the effectiveness of drug therapy and combined therapy (CBT+ drug) on ADHD.

The result was consistent with the findings by Tizdast (2006), while it was inconsistent with Berkeley (2006) and Safer (1976). Considering the temporary effect of drug therapy and symptom relapse after discontinuation, it is claimed that drug therapy can create readiness for CBT acceptance. CBT can stabilize the temporary effects of drug therapy.^{3,30}

Since the study was conducted on children aged 7-13, a limited number of CBT sessions were performed so that the subjects did not have enough time to completely learn the techniques, and there is no power to dominate the cognitive functions in children due to lack of adequate cognitive growth; combining drug and CBT was not capable of displaying more effects than drug therapy on clinical symptoms. The difference was minor between the two methods. As the study by Obikuf et al. (1996) shows (quoted by Tizdast, 2006), using stimulants is questioned due to complications and disagreement on proper dosage for reducing children's problematic behaviors. CBT also has short-term medical benefits and the symptom relapse can be seen immediately after medication discontinuation.³ As a result, combined therapies have led to different results in various studies. Therefore, not only is disagreement found over the nature of ADHD, but also different ideas are seen concerning the most effective treatment methods. Since the disorder is effective academic, job, social, and family performance and little information is found among parents and children, it is essential to find ways of treatment.

The results of our study are consistent with those of studies by Zareiee (2000), Tabayan (2007), and Tizdast (2006) who concluded that drug therapy was effective in reducing ADHD symptoms.^{3,19,31}

Probably due to impulsivity, children diagnosed with ADHD cannot regulate their behaviors and

use the existing conditions. They display more impulsive behaviors which might cause problems in social conditions. Therefore, treating their social problems is a very serious issue. Using Ritalin improves self-regulatory skills. Ritalin intake can also improve responsibility and negativism with parents. It also reduces their disturbing and impulsive behaviors in classrooms and games. The positive effect of Ritalin was reported on sense of collaboration and social acceptance, increased attention in games and sports activities, and reduced delinquent behavior. In terms of academic performance, Ritalin can help children. Researchers believe that Ritalin is probably effective in visual-perceptual disorder, which is a common problem among children diagnosed with disability in learning. Therefore, the results showed that using Ritalin reduced clinical symptoms.

The results are consistent with the following studies: Tizdast (1998) who concluded that self-training increased the performance of students diagnosed with ADHD; Shimabukuro et al. (1999) who believed that self-controlling increased academic performance;³² Raynikheh et al. (2001) who stated that self-controlling practices improved learning performance and self-reinforcing and self-assessment were effective in behavioral change;¹² Jafari (2001) who concluded that relaxation therapy improved the problems of patients suffering from ADHD;¹⁷ Ashtari Zadeh (2002) who believed that self-controlling practices reduced the symptoms;¹⁶ and Tabayan who believed that combined therapy was more effective than lack of treatment.³¹

Cognitive-behavioral interventions are designed to improve and regulate the behavior and possibility of obtaining sustainable behavioral change. This combined therapy is a mixture of behavioral and cognitive techniques. It causes the modification and improvement of impulse control problems, problem-solving, and self-controlling. Studies showed that this interventional approach was effective in children's training to deal with academic and non-academic problems including the increase in willingness of assignment completion, increased concentrated behavior on assignment, increased performance on reading books in children diagnosed with behavioral disorders, and reduced destructive behavior of children diagnosed with ADHD. Behavioral-cognitive techniques are effective in reducing impulse-control problems and hyperactivity of children diagnosed with ADHD. The technique uses behavioral analysis including dependence-based approach and cognition-based approach so that it trains various intermediary approaches. Dependence-based approaches consider behavioral consequences, while the cognition-based approach focuses on

behavioral events. One of the effective techniques in dependence-based approach is self-controlling which is the one's management of behavior and learning, self-assessment, self-monitoring, and self-reinforcement. Self-controlling practices reduce improper behaviors and improve learning performance. Self-reinforcing and self-assessment practices are effective in continuing and generalizing behavioral change of students diagnosed with behavioral disorders.

According to previous studies and our study, it is claimed that drug therapy and CBT are alone effective in reducing clinical symptoms. It is obvious that combining both therapies is supposed to be more efficient in reducing and moderating the symptoms of the individuals diagnosed with ADHD. It seems that when both therapies are integrated, the obvious difference is expected. Although training has positive and dramatic aspects in certain disorders such as ADHD, our findings do not much approve its usefulness for children. It seems that impulsive child has the capability of thoughtful response in his/her cognitive-behavioral resources but not motivated enough. It seems that the best practice in changing their impulsive responses is to integrate motivational methods and cognitive training practices using modeling. Therefore, it is recommended that drug therapy or CBT be along used in the next studies. Older subjects must be selected. Both genders need to be taken into account and more therapies can be employed.

REFERENCES

- Gilberg C. (2003). Deficits in attention, motor control, and perception: a brief review. *Archives of Disease in childhood*, 88.
- Alizadeh, H. (2004). *Reactive ADHD*, Tehran: Rosht Press.
- Tizdast et al. (2006). The Effectiveness of Behavioral, Cognitive-Behavioral, and Drug Therapy and Combined Therapy on ADHD Treatment, *Journal of Psychological Studies*, Islamic Azad University, Khorasgan Branch, Isfahan, No. 27 and 28, Spring and Summer 2006, pp 1-20.
- Teeter, P.A. (1998). *Intervention for ADHD*. Treatment in developmental context. Guildford publications Inc.
- Alizadeh, H. & Andries, C. (2002). Interaction of Parenting Styles and Attention Deficit Hyperactivity Disorder in Iranian Parents. *Child & Family Behavior Therapy*, 24.
- Biederman, Joseph; Monuteaux, Michel C; Doyle, Alysa E; Seidman, Larry J. et al. (2004). Impact of Executive Function Deficits and Attention-Deficit /Hyperactivity Disorder (ADHD) on Academic Outcomes in children. *Journal of Consulting and Clinical Psychology*. Vol. 72(5) 757-766.
- Bridgett, David. J; Walker, Michael. E. (2006) Intellectual functioning in adults with ADHD: Ameta – analytic examination of full scale IQ differences between adults with and without ADHD. *Psychological Assessment*. Vol. 18(1). 1-14.
- Barkley, Russel. A. (2006). *Attention-Deficit /Hyperactivity Disorder: Nature, Course, Outcomes, and Comorbidity*, Retrieved.
- Volkow, ND et al. (2009) Evaluating Dopamine reward Pathway in ADHD. *JAMA* 302(10).
- Chang, Wen-Pin; Davies, Patricia L; Gavin, William J. (2009). Error monitoring in college students with attention – deficit/hyperactivity disorder. *Journal of psychophysiology*. Vol. 23 (3), 113-125
- Longley .Zoe (2009). ADHD Drugs May Increase Kids Risk of Dying .*The American Journal of Psychiatry* on June 15.
- Rynike, M.; Daeelio, F. and Freeman, A. (2001), *Cognitive Therapy in Children and Adolescents*. Trans: Alagheband Rad, J. and Farahi, H. Tehran: Institute of Cognitive Science.
- Kratochwil, T. r. and Morris, R. (2002). *Children's Clinical Psychology*, Trans: Nayeian, M.R. and Colleagues, Tehran: Roshd Press.
- Mir Nasab, M. M. et al. (2007). The Effectiveness of CBT in reducing ADHD Symptoms, *Journal of Exceptional Studies*, 8th Year, No. 1, (2008), pp 69-84.
- Taj, M. (2005). Familiarity with CBT, *Free Psychology Website*.
- Ashtari Zadeh, L. and Ali Pour, A. (2003). The Effect of Self-Assessment Approach on Modifying the Behaviors of Students with Attention Deficit, *Quarterly Journal of Research on Exceptional Children*, No. 3 and 4, 207-222.
- Jafari, M. (2002) The Effectiveness of relaxation therapy on improving children's ADHD problems, M.S. Thesis, Islamic Azad University.
- Rasouli, R.; Omidian, M.; and Samee, F. (2013). The Effectiveness of Mother's CBT on Reducing ADHD Symptoms and Increasing Parents' Happiness, *Quarterly Journal of Family Consultation and Psychology*, Period 3, No. 3.
- Zareiee, M.B. (2000). The Effect of Parents' Behavioral Training and Drug Therapy on ADHD Symptoms, M.S. Thesis, Faculty of Education and Psychology, University of Isfahan.
- Seidan, S.A. and Abdulalh Pour, A. (2014). ADHD and Application of Herbal Medicine, 2nd National Conference of Herbal Medicine in Lifestyle and Traditional Medicine. University of Torbat-e-Heidariyeh, Torbat-e-Heidariyeh.
- Borj Ali, M.; Ali Zadeh, H.; Ahadi, H.; Farokhi, N.A.; Sohrabi, F.; and Mohammadi, M.R. (2014). Comparing Encouragement, Behavioral, and Drug therapy on ADHD Children's Self-controlling Skills, *Quarterly Journal of Clinical Psychology*, Period 4, No. 16.
- Hassan Abadi, S.; Mohammadi, M.R.; and Ahghar, Q. (2012). The Effectiveness of CBT and Drug Therapy on Reduced ADHD Symptoms, *Journal of Disability Studies*, Period 1, No. 2, 19-30.
- Hakim Javadi, M.; Lavasani, Gh.; Shakouri, M.; Abdullahi far, H.R., and Momeni, F. (2015). Comparing Drug Therapy, Behavioral Therapy, and Combined Therapy on Reducing ADHD Symptoms, *Journal of Gorgan University of Medical Science*, Period 17, No. 1, 42-47.
- Kevin M. Antshel, Stephen V. Faraone, and Michael Gordon Antshel K. M., Faraone S. V., Gordon M. (2014). Cognitive Behavioral Treatment Outcomes in Adolescent ADHD. *Journal of Attention Disorders*. 18(6):483-495.
- Sonuga-Barke E. J. S., Brandeis D., Cortese S., Daley D., Ferrin M., Holtmann M., Stevenson J, Danckaerts M., van der Oord S., Döpfner M., Dittmann R.W., Simonoff E., Zuddas A., Banaschewski T., Buitelaar J., Coghill D., Hollis C., Konofal E., Lecendreux M., Wong I. C. K., Sergeant J. (2013). Non-pharmacological Interventions for ADHD: Systematic Review and Meta-Analyses of Randomized Controlled Trials of Dietary and Psychological Treatments. *Am J Psychiatry*. 170:275-289.
- Prasad V., Brogan E., Mulvaney C., Grainge M., Stanton W., Sayal K. (2012). How effective are drug treatments for children with ADHD at improving on-task behaviour and academic achievement in the school classroom? A systematic review and meta-analysis. *European Child & Adolescent Psychiatry*. 22(4):203-216.
- Emilsson B., Gudjonsson G., Sigurdsson J. F., Baldursson G., Einarsson E., Olafsdottir H., Young S. (2011). Cognitive behavior therapy in medication-treated adults with ADHD and persistent symptoms: a randomized controlled trial. *BMC Psychiatry*. 25; 11:116. doi: [10.1186/1471-244X-11-116](https://doi.org/10.1186/1471-244X-11-116).

28. Riggs PD1, Winhusen T, Davies RD, Leimberger JD, Mikulich-Gilbertson S, Klein C, Macdonald M, Lohman M, Bailey GL, Haynes L, Jaffee WB, Haminton N, Hodgkins C, Whitmore E, Trello-Rishel K, Tamm L, Acosta MC, Royer-Malvestuto C, Subramaniam G, Fishman M, Holmes BW, Kaye ME, Vargo MA, Woody GE, Nunes EV, Liu D.(2011). Randomized controlled trial of osmotic-release methylphenidate with cognitive-behavioral therapy in adolescents with attention-deficit/hyperactivity disorder and substance use disorders. *J Am Acad Child Adolesc Psychiatry*. 50(9):903-914.
29. Seif, A.A. (1994), *The Effect of Behavior and Behavioral Therapy: Theories and Methods*, Tehran: Dana Press.
30. Safer, D .J., & Allen, R.P.(1976). *Hyperactive children : Diagnosis and management*. Maryland: University Park Press.
31. Tabayan, S.R. (2007). *The effect of Social Skill Training on Social Skill Increase and Relationship Improvement with Peers in Primary School Male Children Diagnosed with ADHD*. M.S. Thesis, Faculty of Education and Psychology, University of Isfahan.
32. Shimabukuro, S. M; P rater, M. A.; Jenkins, A.; & Smith, p. (1999) . *The effects of self-monitoring of Academic performance on students with learning Disabilities and ADD/ADHD*. *Journal of Education & Treatment of children*, 22, 397.



This work is licensed under a Creative Commons Attribution