Original Article

Effectiveness of Parents-Focused Cognitive-Behavioral Therapy on Attention Deficit Hyperactivity Disorder Symptoms, Obesity and Self-Esteem of Overweight Children with Attention Deficient Hyperactivity Disorder

Afsaneh Karbasi Amel, Saeed Karbasi Amel[1], Arefeh Erfan[2]

From the Behavioral Sciences Research Center, Isfahan University of Medical Sciences, [1]Department of Education and Psychology, Khorasgan Branch, Islamic Azad University, Isfahan, [2]Department of Psychiatry, Tehran University of Medical Science, Tehran, Iran

Abstract

Background: Attention deficit hyperactivity disorder (ADHD) is the most common behavioral problems that cause hyperactivity, attention deficits, academic failure, and emotional and behavioral problems in preschool and elementary school that is often hidden from the parents' eyes. The aim of this study was to determine the effectiveness of parent-based cognitive-behavioral therapy (CBT) on ADHD symptoms (including attention deficit disorder, restlessness, and impulsivity), overweight and self-esteem of 6–11-year-old obese children with attention deficit hyperactivity in Isfahan. **Materials and Methods:** This quasi-experimental study was carried out on 40 children aged 6–11 years with ADHD and overweight or obesity (above the 85th percentile in weight for age, height, and sex diagram) that their parents referred to Isfahan child and adolescent psychiatric clinic of Ali Asghar Hospital in 2015. For twenty patients, only ADHD treatment was applied, and they received no other intervention, but the others in experimental group participated in CBT sessions. Analysis tools were Coppersmith Self-Esteem Scale, ADHD conners' test, and the body mass index (BMI). Data were analyzed using analysis of variance with repeated measurements. **Results:** CBT by teaching parents had a significant effect on ADHD symptoms, the self-esteem of overweight and obese children with ADHD in posttest and follow-up. The results also showed that had a significant effect on ADHD symptoms, overweight and self-esteem of the obese children with ADHD ($P < 0.001$). **Conclusions:** Parents focused CBT can be considered as a complementary treatment for reducing ADHD symptoms and BMI and increased self-esteem in the obese ADHD children.

Keywords: *Attention deficit hyperactivity disorder symptoms, attention deficit-hyperactivity disorder, cognitive-behavioral therapy, overweight, self-esteem*

Introduction

Attention deficit hyperactivity disorder (ADHD) is the most common neurobehavioral disorder among children.[1] The number of children diagnosed with ADHD has significantly increased over the past decade, and almost 50% of children referring to psychiatrists have been diagnosed with ADHD.[2] Recent studies have reported that the prevalence of ADHD is 3%–9% among children and 4%–5% among adults.[3,4] Attention deficit, hyperactivity, and impulsivity, which are the most common childhood psychological disorders, are characteristics of ADHD.[5] People with inattentive ADHD have difficulty paying attention to details; they make careless mistakes when doing their tasks; it seems that they cannot hear when directly addressed; they do not follow instructions and have trouble organizing activities; they often hate and avoid being involved in tasks requiring sustained mental effort; they often lose their things and forget things due to irrelevant environmental stimuli; these people are suffering from memory loss when performing their daily tasks.[5] Behavioral and cognitive impulsivity in these people make them unable to control their thinking, verbal and behavioral processes; they express their feelings without considering the possible consequences; in such cases, they are unable to control themselves and find the appropriate behavior.[6]

On the other hand, results of previous studies have shown a relationship between symptoms of ADHD and overeating.[7]

How to cite this article: Karbasi Amel A, Karbasi Amel S, Erfan A. Effectiveness of Parents-Focused Cognitive-Behavioral Therapy on Attention Deficit Hyperactivity Disorder Symptoms, Obesity and Self-Esteem of Overweight Children with Attention Deficient Hyperactivity Disorder. Adv Biomed Res 2018;7:73.

Received: September, 2017. **Accepted:** January, 2018.

Address for correspondence:
Mr. Saeed Karbasi Amel, Department of Education and Psychology, Khorasgan Branch, Islamic Azad University, Isfahan, Iran. E-mail: saeedkarbasei@gmail.com

Access this article online

Website: www.advbiores.net

DOI: 10.4103/abr.abr_170_17

Quick Response Code:

In fact, people with ADHD have weakness in executive function, self-regulation, and self-control.[8] Overweight children suffer from psychological and social problems, such as depression and low self-esteem.[9] Due to their mobility problems, inattention and the lack of concentration, children with ADHD have negative self-concepts leading to low levels of self-esteem. Indeed, overweight children suffer from low self-esteem and children with ADHD are prone to obesity; hence, the problem of low self-esteem is more severe in obese or overweight children with ADHD.[10] These children have trouble keeping attention on tasks or activities and barely can finish their assignments; they cannot stop overeating, causing parents to spend more time monitoring their behaviors. This type of monitoring puts more pressure on parents, especially mothers, making them prone to depression.[11]

The previous studies have shown that mothers of children with ADHD have a poor relationship with their children. Research also suggests that ADHD may have genetic components; so that, parents of children with ADHD may have similar symptoms to those of their children. It is obvious that such a situation can negatively affect parent–child interactions because these parents are unable to modify and improve their children's behaviors.[5,12]

Unfortunately, the most commonly used stimulants for the treatment of ADHD are not available in Iran. However, it should be noted that medication alone can rarely satisfy the needs of children with ADHD. Furthermore, medication has adverse effects on natural processes of transformation of the central nervous system; it leads to increased appetite, interferes with satiety mechanism and results in weight gain and obesity. Indeed, medicines used for the treatment of ADHD cannot cure the disease, and their effects are only temporarily. Accordingly, using a combination of pharmacological and psychological therapies seems a more effective treatment for ADHD. It is also important that parents, psychiatrists, psychologists, and teachers simultaneously try to help each other create a favorable environment for these children. In fact, the best-established method for the treatment of ADHD is cognitive-behavioral therapy (CBT) plus medication.

Since the ultimate goal in the treatment of ADHD is enabling children to overcome their lives' problems, which cannot be achieved only by medication or forcing children to observe the rules, a parents-focused CBT is quite essential.[13]

In CBT, concepts are presented operationally, and validity of treatment is established experimentally. For this purpose, group or single subject experiments are used in research conditions or clinical trials. Furthermore, for the sake of test-retest reliability, the treatment must be operationalized, and hence that its effects can be assessed using common reliability and validity criteria. A main part of the treatment process is based on the "here and now" approach, and it is assumed that the main goal of the treatment is to help patients create desirable changes in their lives. Thus, the focal point in CBT is providing opportunities for patients to learn new adaptive skills and make necessary changes outside the clinical domains. Therapist, child, and parents try to interact effectively and create strategies to deal with specific problems.[14] ADHD therapists believe that emotions/feelings have an interactive nature and it is necessary to simultaneously consider ADHD symptoms and comorbidities along with weaknesses and strengths of children, their parents and their social lives. As mentioned, medication alone is not a treatment for ADHD; hence, nonmedication treatments, such as individual and group psychotherapy, behavior therapy, and parents/teachers education are needed.[15]

It is obviously necessary to conduct studies investigating more efficient treatments for ADHD with minimal adverse effects and maximum recovery. On the other hand, the number of children and adolescents diagnosed with ADHD is increasing making it more necessary to find an appropriate nonmedication treatment for the disease. Accordingly, the present study was conducted to investigate the effectiveness of a parents-focused CBT in reducing ADHD symptoms, increasing self-esteem and improving weight loss in children with ADHD.

Materials and Methods

The present quasi-experimental study with a pretest-posttest design was conducted on 40 obsess children (6–11 years of age) with ADHD and their parents referring to Psychiatric Clinic for Children and Adolescents in Isfahan (Iran) in 2015. Using convenience sampling method, the participants were selected and randomly divided into two groups of experimental and control (20 parent–child pairs in each) [Figure 1].

The inclusion criteria for children included being diagnosed with ADHD according to the diagnostic and statistical manual of mental disorders (DSM)-5 criteria by a psychiatrist and having a body mass index (BMI) above the 85th percentile in the weight chart by age and gender. The inclusion criteria for parents included having a high school diploma or a higher than high school degree, living in the city of Isfahan (for follow-ups) and being interested in complete participation until the end of the study. The exclusion criteria for children included having other psychiatric disorders or other diseases negatively affecting the study, pharmaceutical changes based on the changes in the patients' situations, being absent for more than two sessions and not being interested in continuing the treatment process. Parents were excluded if being diagnosed with a major mental disorder according to DSM-5 criteria by a psychiatrist.

At the beginning of the study, gender, age, weight, height, and BMI of every participant were recorded. Then, children

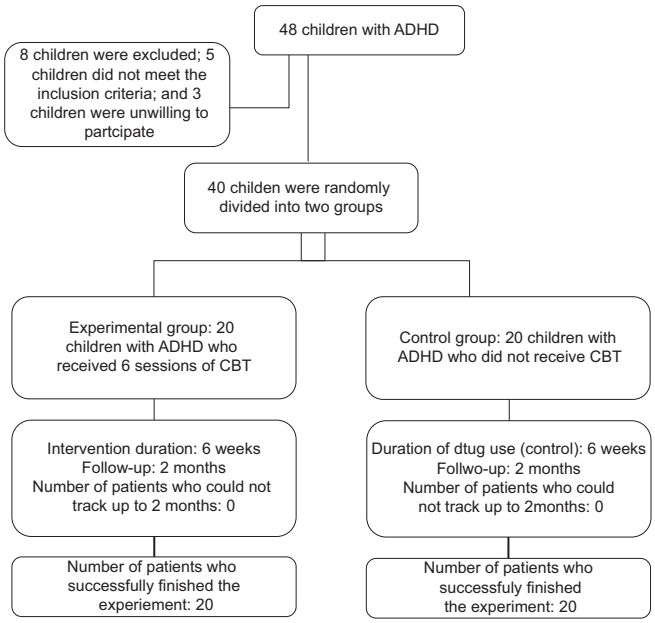

Figure 1: The study flowchart

and parents, respectively, completed the Coopersmith Self-Esteem Inventory (SEI) (1987) and the Conner's Parent Rating Scales-Revised (CPRS-R) (1996) as the pretests.

For weight measurement, a seca scale was used. The children's weights were measured and recorded in kilograms when they were wearing thin clothes and no shoes. Their weights were controlled every session using a 5 kg control weight. For height measurement, a measuring tape was used. The children's heights were measured and recorded in meters, when they were wearing no shoes and standing straight with their back of the heads, shoulder blades, buttocks, and heels touching the wall. Ultimately, the children's BMIs were calculated and recorded.

The Coopersmith SEI (1987) was used to assess children's self-esteem. This inventory consists of 58 items, eight of which are lie detectors. The rest of the items assess four subscales. The rest of the items assess four subscales of general self-esteem, social self-esteem (social), home self-esteem (home), and school self-esteem (school). Each item in the SEI is answered and scored by either 0 (no) or 1 (yes), and higher total scores indicate higher levels of self-esteem. The SEI is initially developed for children ages 6–10 years, but its items can be rephrased for being used in different age groups. Previous studies have confirmed both validity and reliability of the SEI. Validity and reliability of the SEI have been, respectively, reported 0.58 and 0.84 in studies outside Iran and 0.60 and 0.92 in studies inside Iran.[16,17] Considering that the SEI is a standard test, its validity was accepted, and its reliability was measured in the present study using the Cronbach's alpha (0.83).

The CPRS-R (1996) was used to assess ADHD symptoms in children. The CPRS-R is used to assess the effectiveness of stimulant drugs in the treatment of hyperactivity and the severity of ADHD symptoms and children's misconducts. The CPRS-R is a 48-item questionnaire assessing five subscales of behavioral problems, learning problems, psychosomatic problems, hyperactivity/impulsivity, and anxiety/passivity. The CPRS-R is scored on a 4-point Likert scale ranging from 0 (not true at all) to 3 (very much true). Previous studies have confirmed both validity and reliability of the CPRS-R. Validity and reliability of the CPRS-R have been, respectively, reported 0.57 and 0.90 in studies outside Iran and 0.85 and 0.84 in studies inside Iran.[18,19] Considering that the CPRS-R is a standard test, its validity was accepted, and its reliability was measured in the present study using the Cronbach's alpha (0.89).

Children in the experimental group received a CBT-based intervention. The used intervention in the present study was a combination of a family-focused program, cognitive-behavioral treatment for obesity (Cooper, Fairburn, and Hawker, 2003) and an intensive weekly program. Cognitive-behavioral strategies were taught to parents during six 90-min sessions. At the end of each session, next week's assignments were specified, covered issues were practiced, and parents' questions were answered. Descriptions of all sessions are presented in Appendix I.

Participants in the control group did not receive any intervention except ADHD routine treatment.

At the end of the intervention, weight, and BMI of every participant were recorded again. Then, every child completed the SEI, and every parent completed the CPRS-R as the posttests. Two months after the intervention, weight, and BMI of every participant were recorded and they completed the SEI and the CPRS-R for the third time.

Finally, the collected data were analyzed using the SPSS-version 22 (SPSS Inc. Chicago, Illinois) software: Mean and standard deviation were used to describe the data; Kolmogorov–Smirnov test was used to check the normality of the data; Repeated Measures ANOVA was used to determine the effects of the intervention on each variable (i.e., self-esteem and BMI); independent *t*-test was conducted to compare the average self-esteem scores and BMIs in each group at different pairwise intervals; independent *t*-test was also used to compare the average self-esteem scores and BMIs between the two groups at each of the examined time (before, immediately after, and 2 months later) ($P < 0.05$).

Results

According to the results, the average age of the children was 8.4 ± 1.8 years; nearly 67.5% of the children were male and 32.5% were female; the average age of children in the experimental group was 8.2 ± 1.8 years and of children in the control group was 8.6 ± 1.7 years ($P = 0.43$); there were 13 (65%) boys and 7 (35%) girls in the experimental

group and 14 (70%) boys and 6 (30%) girls in the control group (P = 0.74) [Table 1]; accordingly, there was no significant difference in age and gender between the two groups.

The results of comparing the examined variables between the two groups are presented in Table 2. Accordingly, BMI was significantly lower immediately after the intervention (P = 0.001) and 2 months later (P = 0.01) in the experimental group. However, it was significantly higher in the control group 2 months after the intervention (P = 0.02). At the end of the intervention, BMI was significantly higher in the control group; but, no significant difference was observed between the two groups 2 months after the intervention. The results of repeated measures ANOVA, comparing BMI changes over time, showed no significant difference between the two groups (P = 0.84).

The average CPRS-R scores at the end of the intervention and 2 months later were significantly lower than the average CPRS-R scores at the beginning of the intervention in both groups (P = 0.001). Comparing the two groups, the average CPRS-R score was significantly lower in the control group immediately after the intervention (P = 0.001). Similarly, the average CPRS-R score was significantly higher in the experimental group 2 months after the intervention (P = 0.001). However, changes in the average CPRS-R scores were significantly different between the two groups at the end of the intervention (P = 0.007). Changes in the CPRS-R scores are presented in Figure 2, indicating a significant difference between the two groups (P = 0.001). The average SEI score was significantly higher in the experimental group immediately after the intervention and 2 months later (P = 0.001). In none of the groups, the average SEI scores were not significantly different at the end of the intervention and 2 months later compared to the beginning of the intervention. However, changes in the average SEI scores were significantly different between the two groups at the end of the intervention (P = 0.001). Changes in the SEI scores are presented in Figure 2, indicating a significant difference between the two groups (P = 0.001).

Table 1: Comparison of the mean age and gender distribution between children in the two groups

Demographic factors	Total (n=40), n (%)	Intervention (n=20), n (%)	Control (n=20), n (%)	P
Age (year)	8.4±1.8	8.2±1.8	8.6±1.7	0.43
Sex				
Boy	27 (67.5)	13 (65)	14 (70)	0.74
Girl	13 (32.5)	7 (35)	6 (30)	

Discussion

The results of this study showed that BMIs of children who received the intervention significantly decreased immediately after the intervention and 2 months later, whereas, BMIs of children in the control group significantly increased in the same period. Accordingly, it can be stated that a parents-focused CBT can positively affect BMI of children with ADHD. In line with results of the present study, several other studies have shown that family-based interventions are suitable for weight loss maintenance and the treatment of obesity.[19-22] Similarly, results of other studies done by Bayat *et al*. and Sadeghi *et al*. have shown the effectiveness of family-based CBT in children's weight loss.[23,24] These studies have indicated that family-based behavioral therapies integrated with cognitive skills are the most effective treatments for obesity in childhood. In fact, CBT is known as an appropriate therapeutic approach for the treatment of obesity. It has been proven that family-based interventions that involve parents in the process of treatment are very effective in weight control and development of healthy habits. Studies have shown that almost every effective intervention includes a family component, such as separate training programs for children and parents.[25,26] Vos *et al*. showed the

Table 2: Comparison of body mass index, attention deficit hyperactivity disorder symptoms and self-esteem scores of children with attention deficit hyperactivity disorder at different times

Variables	Group	Before	After intervention	P^b	P^c	After 2 month	P^d
BMI	Intervention	18.8±1.3	18.6±1.3	<0.001	0.11	18.7±1.3	0.01
	Control	19.3±1.4	19.4±1.3	0.1		19.5±1.4	0.02
	P^a	0.238	0.044			0.051	
Canner's ADHD	Intervention	116.7±15.2	71±14.6	<0.001	0.007	74.1±17.1	<0.001
	Control	112.9±15.2	95.6±14.5	<0.001		92.5±14.5	<0.001
	P^e	0.43	<0.001			0.001	
Cooper-smith	Intervention	91.3±3.2	95.7±2.4	0.86	<0.001	98.7±2.6	0.91
	Control	90.8±3.2	90.9±2.6	0.61		93.8±1.6	0.31
	P^e	0.66	<0.001			<0.001	

P^a: Significance level of independent t-test comparing variable's means between the two groups before, immediately after and 2 months after the intervention, P^b: Significance level of paired t-test comparing variable's means before and after the intervention in each group, P^c: Significance level of paired t-test comparing variable's means before and 2 months after the intervention in each group, P^d: Significance level of repeated measures ANOVA comparing variable's means before and after the intervention in each group. Data are presented as mean±SD. SD: Standard deviation, ANOVA: Analysis of variance, BMI: Body mass index

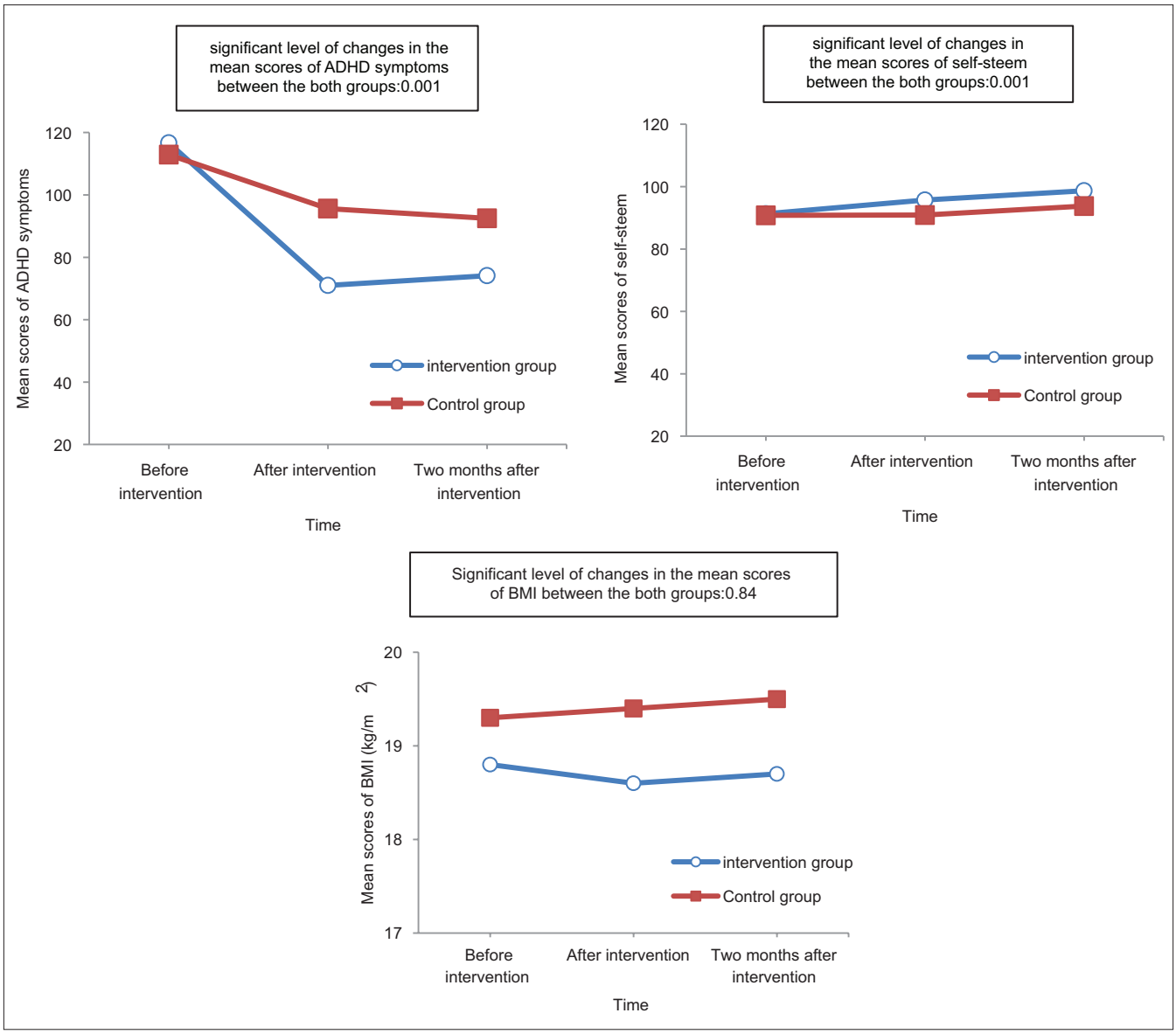

Figure 2: Study flowchart. Linear graphs of body mass index, attention deficit hyperactivity disorder symptoms, self-esteem scores of children with attention deficit hyperactivity disorder at different times

effectiveness of parents-based CBT in obese children's weight loss.[20] The only problem here is that this type of therapy has not been considered seriously by researchers studying obesity in children with ADHD. In fact, most studies have examined the causes of obesity in children with ADHD and reported that a possible reason is a close relationship between impulsivity and loss of control over food intake. These studies have shown that children with ADHD are 12 times more prone to the loss of control eating syndrome (LOC-ES) than normal children and that overweight children with LOC-ES are 7 times more likely to have ADHD than normal children.[27] Therefore, the development of an appropriate treatment that can be added to drug therapy seems quite essential to treat children with ADHD. This accompanying treatment can be achieved by conducting further clinical trials.

Self-esteem of children in the experimental group increased after the intervention and 2 months later; however, the difference was not statistically significant ($P > 0.05$). Self-esteem of children in the control group did not change ($P > 0.05$). At the beginning of the intervention, the average SEI scores were not statistically different between the two groups, but the average SEI score of children in the experimental group was significantly higher than the average SEI score of children in the control group immediately after the intervention and 2 months later ($P < 0.001$). These results were in line with results of various studies on increasing perception of self-esteem in children with ADHD and some studies inside and outside Iran.[10,28,29] In other words, results of the present study along with results of other studies have shown that training the parents can decrease impulsivity and hyperactivity

positively affect behavioral problems and aggressiveness and lead to increased levels of self-esteem in children with ADHD. Such education can positively affect parents as well because it can lead to reduced levels of stress and boosted self-esteem. A child' self-esteem is the basis of his perceptions of life experiences and therefore, is of great importance. Resulting from positive self-assessments, socialemotional competence can help children overcome their future problems. Children who feel good about themselves can overcome their problems more effectively. Accordingly, it can be concluded that CBT can improve self-image; reduce dysfunctional beliefs; and enhance levels of self-esteem in children with ADHD.

ADHD symptoms were similar between the two groups at the beginning of the intervention; but, those symptoms significantly decreased in the experimental group after the intervention ($P < 0.001$). Although children in the control group did not receive any intervention, their ADHD symptoms decreased as well ($P < 0.001$). However, ADHD symptoms decreased more significantly in the experimental group than in the control group ($P < 0.001$). Therefore, it can be stated that ADHD symptoms may decrease over time, but CBT can speed up this process. In this regard, various studies have shown that CBT is an effective method for the treatment of ADHD symptoms.[6,30,31]

In fact, rising parental awareness-without focusing on reducing the behavioral problems-can lead to positive parent–child interactions; improve parents' behaviors; and decrease hyperactivity and aggressiveness in children.[30] In this regard, Montoya *et al.* has emphasized the importance of ADHD treatment as it provides a basis for future learning quality; leads to positive educational experiences; and prevents secondary problems such as obesity, sleep disorders, emotional complications, and interactional/educational/behavioral problems.[31] However, these findings are not consistent with results of a study conducted by Rueda *et al*. *in* 2004.[32] These different results may be explained by considering the differences between parental behaviors, perceptions, and styles along with other various factors affecting ADHD symptoms.

In any case, most studies have confirmed that combination therapy and medication are more effective than behavioral therapy alone. Furthermore, parents have reported that combination therapy is more effective than behavioral therapy, but it is not better than medication. On the other hand, concerning the reduction of basic symptoms of ADHD, there is no difference between combination therapy and medication. Hence, although medication can adequately reduce ADHD symptoms, combination therapy is necessary to improve other functional domains. Accordingly, other than medication, children with ADHD need a variety of psychosocial interventions, such as verified parents' education programs. To explain the results of this study, it can be pointed out that people can better understand their behaviors when they are more knowledgeable and conscious. This increased awareness naturally causes more appropriate behaviors and less inappropriate behaviors.[33]

One of the limitations of the study was not able to control the parents' behavior according to the study protocol and training session and also it may affect by their socioeconomic and educational status.

Considering the results of this study, CBT can be considered a simple and low-cost treatment for obesity, ADHD, and low self-esteem.

Among the limitations of the present study, studying a single age group, having a small sample size, short interval between the end of the intervention and its follow-up and not examining mothers' mental states can be mentioned. As a result, it is recommended to conduct future similar studies on bigger sample sizes, various age groups and over longer time intervals to become able to generalize the results confidently.

Conclusions

Results of the present study indicated that parents-focused CBT is effective in the treatment of obesity, ADHD, and low self-esteem of overweight children with ADHD (ages 6–11). Therefore, if parents' education can enrich families, it can also improve children's attention. Moreover, many social and economic problems can be prevented by conducting psychological-educational interventions which play an important role in the treatment of ADHD.

Acknowledgments

This project was performed at Azad University of Khorasgan. We appreciate the patients and their parents who participated in this study.

Financial support and sponsorship

Azad University of Khorasgan.

Conflicts of interest

There are no conflicts of interest.

References

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. Tehran: Sokhan Publishing Company; 2000.
2. Sadock B, Sadock V, Ruiz P. Synopsis of Psychiatry Behavioral Sciences/Clinical Psychiatry. Kluwer tEPW; 2014.
3. Lufi D, Parish-Plass J. Sport-based group therapy program for boys with ADHD or with other behavioral disorders. Child Fam Behav Ther 2011;33:217-30.
4. Spencer TJ, Adler LA, Meihua Qiao, Saylor KE, Brown TE, Holdnack JA, *et al.* Validation of the adult ADHD investigator symptom rating scale (AISRS). J Atten Disord 2010;14:57-68.
5. Barkley RA, editor. Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment. Guilford Publications; 2014.
6. Ramsay JR. CBT for adult ADHD: Adaptations and hypothesized

mechanisms of change. J Cogn Psychother 2010;24:37-45.
7. Cortese S, Angriman M, Maffeis C, Isnard P, Konofal E, Lecendreux M, *et al.* Attention-deficit/hyperactivity disorder (ADHD) and obesity: A systematic review of the literature. Crit Rev Food Sci Nutr 2008;48:524-37.
8. Graziano PA, Bagner DM, Waxmonsky JG, Reid A, McNamara JP, Geffken GR, *et al.* Co-occurring weight problems among children with attention deficit/hyperactivity disorder: The role of executive functioning. Int J Obes (Lond) 2012;36:567-72.
9. Kaplan K, Suddok B. A Summary of Psychiatry. 3rd edition. Tabriz: Shahrab Publications; 2003.
10. Frame K, Kelly L, Bayley E. Increasing perception of self-esteem in children with ADHD and peer problem? J Child Adolesc Psychopharmacol 2003;9:85-94.
11. Moed A, Gershoff ET, Eisenberg N, Hofer C, Losoya S, Spinrad TL, Liew J. Parent–child negative emotion reciprocity and children's school success: An emotion-attention process model. Social Development 2017;26: 560-74.
12. Dadsetan P. Transformational Psychopathology from Childhood to Adulthood. Tehran: Samt Press; 1999.
13. Granger DA, Whalen CK, Henker B. Perceptions of methylphenidate effects on hyperactive children's peer interactions. J Abnorm Child Psychol 1993;21:535-49.
14. Howton K, Salkvskis P, Kirk J, Clark D. Cognitive Behavioral Therapy for Psychiatric Problems a Practice Guides. Tehran: Publications Mighty on Original Language; 2001.
15. Swanson JM, McBurnett K, Wigal T, Pfiffner LJ, Lerner MA, Williams L, *et al*. Effect of stimulant medication on children with attention deficit disorder: A "review of reviews". Except Child 1993;60:154-62.
16. Herz L, Gullone E. The relationship between self-esteem and parenting style a cross-cultural comparison of Australian and Vietnamese Australian adolescents. J Cross Cult Psychol 1999;30:742-61.
17. Hassani R, Mirzaeeian B, Khalilian A. Effectiveness of cognitive behavior-based play therapy on anxiety and self-steem of children with attention deficit/hyperactivity disorder (ADHD) children. Mod Psychol Res 2013;8:165-82.
18. Isanezhad O, Chahardoli D. The effectiveness of the Adults and Children Together-Parents Raising Safe Kids Program in reducing behavioral and emotional problems among preschool children. International journal of behavioral sciences 2017;11:23-9.
19. Conners CK, Sitarenios G, Parker JD, Epstein JN. Revision and restandardization of the conners teacher rating scale (CTRS-R): Factor structure, reliability, and criterion validity. J Abnorm Child Psychol 1998;26:279-91.
20. Vos RC, Wit JM, Pijl H, Kruyff CC, Houdijk EC. The effect of family-based multidisciplinary cognitive behavioral treatment in children with obesity: Study protocol for a randomized controlled trial. Trials 2011;12:110.
21. Kitzman-Ulrich H, Wilson DK, St George SM, Lawman H, Segal M, Fairchild A, *et al.* The integration of a family systems approach for understanding youth obesity, physical activity, and dietary programs. Clin Child Fam Psychol Rev 2010;13:231-53.
22. Bussing R, Mason DM, Bell L, Porter P, Garvan C. Adolescent outcomes of childhood attention-deficit/hyperactivity disorder in a diverse community sample. J Am Acad Child Adolesc Psychiatry 2010;49:595-605.
23. Bayat E, Rahimian Boogar I, Talepasand S, Yousefichaijan P, Hamidi Z. Effect of family-based cognitive behavioral therapy in modification of self-image associated with obesity among children. J Mazandaran Univ Med Sci 2016;26:115-27.
24. Sadeghi K, Gharraee B, Fata L, Mazhari SZ. Effectiveness of cognitive-behavioral therapy in treating patients with obesity. Iran J Psychiatry Clin Psychol 2010;16:107-17.
25. Cooper Z, Doll HA, Hawker DM, Byrne S, Bonner G, Eeley E, *et al.* Testing a new cognitive behavioural treatment for obesity: A randomized controlled trial with three-year follow-up. Behav Res Ther 2010;48:706-13.
26. Shrewsbury VA, Steinbeck KS, Torvaldsen S, Baur LA. The role of parents in pre-adolescent and adolescent overweight and obesity treatment: A systematic review of clinical recommendations. Obes Rev 2011;12:759-69.
27. Cortese S, Morcillo Peñalver C. Comorbidity between ADHD and obesity: Exploring shared mechanisms and clinical implications. Postgrad Med 2010;122:88-96.
28. Mazaheri A, Baghban I, Fatehzadeh M. Effects of self esteem group training on students'social adjustment. J Behav 2006;13:49-56.
29. Fatemeh G, Pouran T, Naval H, Marzieh A. Investigating the Relationship between Self-Esteem, Assertiveness and Academic Achievement in Female High School Students. International Journal of current Medical and Applied sciences; 2016, 11(1),51-56.
30. Singh NN, Singh AN, Lancioni GE, Singh J, Winton AS, Adkins AD. Mindfulness training for parents and their children with ADHD increases the children's compliance. J Child Fam Stud 2010;19:157-66.
31. Montoya A, Colom F, Ferrin M. Is psychoeducation for parents and teachers of children and adolescents with ADHD efficacious? A systematic literature review. Eur Psychiatry 2011;26:166-75.
32. Rueda MR, Fan J, McCandliss BD, Halparin JD, Gruber DB, Lercari LP, *et al.* Development of attentional networks in childhood. Neuropsychologia 2004;42:1029-40.
33. Conners CK, Epstein JN, March JS, Angold A, Wells KC, Klaric J, *et al.* Multimodal treatment of ADHD in the MTA: An alternative outcome analysis. J Am Acad Child Adolesc Psychiatry 2001;40:159-67.

Appendix

Appendix 1: Descriptions of therapy sessions (Voss, 2011; Cooper, 2003)

#	Description
Session 1	Specifying therapy program and reforming expectations; encouraging parents; explaining the importance of daily assignments and their roles in the treatment process; introducing the members to each other; expressing the rules in every session and emphasizing that every member should comply with those rules; expressing losing weight principles, energy balance, causes of obesity, risks associated with obesity (e.g., low self-esteem); expressing characteristics of ADHD and its appropriate treatments, barriers to treatment; and explaining how to monitor daily calorie intake
Session 2	Defining the traffic light labeling system to control food intake in children; defining healthy nutrition and eating habits; designing an appropriate diet program for children based on their age, weight and gender; providing parents with an informative brochure specifying how much/when/where to eat
Session 3	Teaching children self-relaxation, self-control, self-regulation and self-reward techniques, problem-solving skills and positivity; teaching parents how to support their children and give effective feedback; encouraging daily physical activities for the entire family; teaching parents how to respect, encourage and admire their children; describing the importance of monitoring children's daily activities
Session 4	Teaching healthy parenting styles, such as teaching how to give orders to children, reward and punishment principles, how to effectively communicate with children and the three communication styles: passive, aggressive and assertive
Session 5	Describing psychological causes of overeating and obesity; describing healthy body image to parents and children and teaching parents to provide appropriate feedbacks; explaining how to identify and correct erroneous thoughts; teaching children how to effectively communicate with their peers
Session 6	Talking about roles of family members in the treatment process; explaining the needs to make further changes while accepting oneself; teaching an active life style; teaching techniques to avoid relapse; repeating issues covered in previous sessions; questioning and answering; measuring children's weights and calculating their BMIs

BMI: Body mass index, ADHD: Attention deficit hyperactivity disorder