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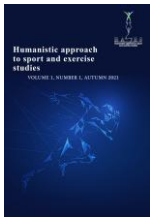

The Effect of Eight Weeks of Online Body Balance Program on Anxiety, Depression and Aggression of Children with Attention Deficit/Hyperactivity Disorder

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Abstract: During the Covid-19 pandemic, the use of online sports programs became popular. The purpose of this study was to investigate the effect of eight weeks of online body balance program on anxiety, depression, and aggression of children with attention deficit/hyperactivity disorder (ADHD). Body balance is a sport based on yoga, tai chi, and Pilates. The present study was a semi-experimental and applied type of study. The participants of the present study were 30 volunteer children with ADHD who were divided into two experimental (15 people) and control (15 people) groups by random assignment method. Aggression, depression, and anxiety variables were evaluated by Bass and Perry questionnaire, Maria Kvas children's depression questionnaire, and Revised Children's Manifest Anxiety Scale. The experimental group performed online body balance training for 8 weeks (3 sessions per week for 60 minutes) online, and the control group did their current activities. In order to investigate intra-group and inter-group differences, repeated measures ANOVA at the error level of 0.05 was used by SPSS software. The results showed there was significant difference in the average level of symptoms of depression, anxiety and aggression in the pre-test and post-test stages ($P \leq 0.05$), between the two control and experimental groups ($P \leq 0.05$) and the interaction effect of time and group ($P \leq 0.05$). The results of Tukey's test showed that there was a significant reduction of these symptoms between the two experimental and control groups in the variables of depression symptoms (-5.500), anxiety symptoms (-5.133) and aggression symptoms (-13.133). Based on the results of this research, eight weeks of body balance training reduced depression, aggression and anxiety symptoms in 7-9 year old children with attention deficit/hyperactivity disorder. Therefore, the improvement of mental disorders caused by this disease in children following the body balance exercise program emphasizes the importance of using this intervention method for children with ADHD.

Keywords: Body balance, hyperactivity, anxiety, depression, aggression.

1. Introduction

Attention deficit/hyperactivity disorder (ADHD) is one of the most prevalent Neurological disorders or growth failure (1) which accrues mostly in early childhood (2, 3) and establishes by different levels of Neglect, Hyperactivity, and Impulsiveness (4). This disorder is one of the most prevalent psychotherapy disorders in childhood and one of the early reasons referencing psychotherapy (5). The prevalence of this disorder among children has been reported nearly 7/2 percent across the world and 2 to 18 percent in Iran (6).

It seems that there is a relationship between social inappropriate behaviors and the main characteristics of this disorder (8). It has been showed that children with ADHD, are suffered from some lateral disease such as depression, anxiety and aggression (9). These children might react inappropriately in social interactions which can be criticized by the society. In Between 25-50 percent of them, ADHD is along with social anxiety (10). In a study of Mitchison et al. (2019) it has been clarified that 42 percent of people with ADHD are suffered from anxiety and 22 percent are experienced depression (11). On the other hand, about 75 percent of people with hyperactivity are directly showing aggression and disobediences (12). These children are incapable of discontinuing their activity in the definite time, are constantly moving and dynamically agitating (13).

At the moment, ADHD medical treatments are mostly medicines, psychological consultation and behavior therapies. Although chemotherapy has been affective in managing ADHD's symptoms, but there are some potential undesirable consequences such as high priced expenses, and receivers' lack of normalization in a longtime (14). Many of recent studies showed that training appropriately can effectively decrease. Some studies have shown that severe training and regular physical activities (14), can stimulate psychological and physiological mechanisms that not only improve physical and mental health, but also enhance cognitive and physiological performances such as memory and administrative performance (15, 16). Clinical rehabilitation training is useful for reinforcing kinetic coordination, cognitive performance, and interpersonal skills or normality disorders (17). this research has been agreed on the role of medical training and physical activities like developmental physical education (18), playing games and training kinetic skills (19), aerobic training with music (20), rhythmic physical training (21), regular physical training (22), the interference of yoga (23, 24), aerobic (14) on controlling hyperactivity, enhance psychological facets and improve physiological and neural features of children with ADHD. The findings of this research indicate that training activities with different extremes are useful for children with ADHD. in many investigations, there was an emphasis on the role of two sports Yoga and Aerobic to enhance hyperactivity disorder. Nevertheless, the ever increasing development science and various training activities have provided the opportunity for researchers to study about training activities for different people. One of the modern trainings is related to body balance training.

Body balance is a commercial name for training of rhythmic resistance movements on great and small muscular categories which is a mixture of Yoga, Tai chi and Pilates and improves some of the physical fitness factors (25). Body balance can cause self-mastery, sense of being powerful, relaxation and consideration (25) in order to make individuals more vigilant both physically and mentally. This starts with Tai Chi to relax within and gradually involves the body into the next section. Therefore, the Yoga training will be used to stretch body and the stomach area practicing with several Pilates training (25). Using body balance training has been examining the physical fitness parameters of children with severe intellectual disability (26), the elderly's' life quality and balance (27), and kinetic performance after apoplexy (28).

Hence the role of medical training is notable and economical from medical training because of the perilous features of medical training. Researchers are examining the impact of using body balance training on psychological features for people with ADHD. according to the significance of body balance impact on people with hyper correction, the lack of universal and domestic investigations about body balance training on people with hyper correction, the existing gap, and based on the available evidence of the impact of using body balance training on enhancing psychological features, researchers seek to answer this question: Does 8 weeks online body balance training have any impact on controlling depression, anxiety, and aggression of children with ADHD or not?

2. Materials and Methods

2.1 Participants

The present study consists of 30 female students with ADHD aged from 7 to 9 from Mashhad a city in Iran, and they participated in the research through questionnaires and doctors' approval. For determining the sample size, the result of the parallel and previous studies (29) and the G power software were used. According to confidence level of 0/95 and power of the test 0/90 percent, there needs to have at least 13 subjects in each group of the study. As a result, by taking into account the possible decline of the samples, 15 subjects were used to participate in each group. The participants were divided into two groups of experimental (15 individuals) and control groups (15 individuals) by random sampling. according to the pretest scores and the intended characteristics in the initial examination, the early basis to participate in the research was the 7-9 year-old female students of Mashhad with ADHD, by obtaining 34 score of clinical questionnaire of Conners for parents, psychiatrist's approval for hypercorrection according to clinical interview, parents' agreement to participate in the study, physical health, lack of orthopedics' issues, respiratory health, lack of severe backache in the last six months, and lack of using tranquillizing and anti-anxiety drugs. also factors like difficulty in practical protocols and disability to perform the movements, lack of association and dispending of participation into the study, association in regular schedules not related to study, absence in more than two constant sessions and three alternative ones, and the dispensing of performed study were considered as egress measures.

2.2 Instruments

2.2.1 Conner's clinical questionnaire:

This questioner consists of 26 questions completed by parents. The items are rated based on multiple choice scale of Likert and the scope of each question is varied from 0 (not at all, never, or rarely) to 3 (totally agree, often, almost all). The questioner has four subscales of objection, cognitive disorder, neglect, impulsiveness, and ADHD. To evaluate the result of this test by acquiring the mean of 1/5 or higher will argue the existence of attention deficit/ hyperactivity disorder. In other words, the questioner has 26 questions with a total range from 26 to 104.by acquiring the score higher than 34, the attention deficit/ hyperactivity disorder will be recognized. The more increased score, the more child disorder happens and contrariwise (30). Conners et al. (1997) reported 0/90 as the scale's stability (30). The questionnaires validation has been reported 0/90 by cognitive science institutions.

2.2.2 Children's depression questionnaire by Maria Kvas (CDI)

This is a self-reported instrument by 27 items in order to examine the depression symptoms in children and teenagers. The questionnaire items are adopted from Back's depression questionnaire and each item can investigate a specific childhood depression. CDI consists of 5 subscales such as negative temperature, personal issues, sense of uselessness, lack of enjoyment, and low self-esteem. The items are rated from 0 (lack of symptoms) to 2 (specific symptom), the total score would calculated and all the items would be considered with a scope of 0 to 54. The more there are individuals' scores, the more extremeness of depression will be (32). The internal consistency based on Cronbach's alpha of 0/86 has been reported for this study (33).

2.2.3 Children's manifest anxiety questionnaire by Reynolds and Richmond (RCMAS)

The following questionnaire consists of 37 questions with the aim of children's manifest anxiety from different perspectives, psychological, extreme sensitivity, consideration, worries. The range of answers would be related to one point to each Yes answers and zero point to each No answers. Taghavi et al research (1382) has reported the validity of this test of 0/67 (34). In addition, the study of Monfared et al (1381), the validity of this scale was 0/83 and Monfared et al (1381) has achieved the stability of this scale, 0/87 for people with disease and 0/81 for abnormal behaviors.

2.2.4 The anxiety questionnaire of Bass and Perry

This is a self-reported questionnaire consisting of 29 items and 4 subscales of physical anxiety, verbal anxiety, anger and animosity. Rating this questionnaire is in Lakerd scale 5 degrees which was (1.not the same as me, 2.the same as me, 3.not the

same and not different, 4.almost the same as me, 5.totally the same as me). The 9 and 16 items are considered reversely. The total score for anxiety will be by indicating the whole score of sub scales. The way of rating consists of sub scales that are physical anxiety (9 items) : I break things when I feel anxious, verbal anxiety (5 items) : when I do not agree with my friends, I will tell my opinion freely, anger (7 items): some of my friends think I am impatient and irritable, animosity (8 items) : sometimes I feel jealous (36,37). Bass and Perry considered the internal consistency coefficient of this questionnaire 0/89 and reported its stability by using the reexamining approach by 0/80 (36, 37).

2.3 Procedure

This study consists of 5 main stages divided into population and samples, accepting and rejecting skills, completing the personal form, and individuals' approval, performing the pretest, performing the training protocol, and eventually performing the post test. The way of choosing participants was setting the announcements in health centers, social websites and the schools that about 70 individuals were chosen as volunteers. In order to diagnose the people with ADHD, in addition to doctors' approval, the Conner's clinical questionnaire was used. after all collecting the demographic information (age, height, gender,...) and participants' parents' approval, they randomly divided into two groups of experimental (15 participants, age mean: 8/06, height: 130/20, weight: 30/73) and the control group (15 participants, age mean: 8/20 height: 132/13, weight: 20/20). The procedure of this study was explained earlier (both verbal and functional) to children before the test and their parents were aware of the study's procedure. In the pre-test stage, the Bass and Perry's questionnaire was used to evaluate aggression, children's depression questionnaire of Maria Kvas for evaluating depression, and the anxiety questionnaire of Reynolds and Richmond was used to evaluate anxiety. After completing the pre-test, the experimental group did the online body balance training for 8 weeks (3 sessions in a week for 60 minutes) and the control group were doing their common activities. the training protocol included stretching activities, strength and confirmatory training in waste, basin, legs, body, body muscles, shoulder girdle muscles, arms, forearm, etc. for children with ADHD in the experimental group, there was an online mixture of basic trainings of body balance activities with games and creativity for 8 weeks in the mornings and it was under the tutor's consideration. The first stage was warming up, the second one was doing the basic body balance training, and the chosen body balance training, and the third stage was coming back to normal circumstances. the control group used their daily training with the goal of creating balance, mental freshness, concentrating and empowering the lower part of the body's muscles, maintaining the balance of upper body and lower part of the body, anxiety and depression alleviation, managing stress and depression, a balance between body and the mind, correcting the habits in sitting and walking, and avoiding mental and physical tensions, empowering back and central muscles, boosting and resisting dynamic balance, reinforcing mind, making flexibility in lower part of the body, to enhance balance and perform relaxing training. Finally, after 8 weeks the aforementioned questionnaire was handed to participants again and after adding up the research's stages and gathering information of samples, the research data was summing up and added into SPSS software.

2.4 Analysis

To control the information of the study and investigate the details of normal distribution, the Shapiro-Wilk test was used to examine the Levene's test variance. to explore the intra and inter-group differences of pre-test and post test scores, the variance analyze test with repeated measures in error rate of 0/05 was used by SPSS software.

3. Results

The result of the Independent T-test showed there is no significant difference between the two groups (control and experimental) in demographic information of age, weight and height and score of ADHD before interference. (P>0/05) and the 2 groups were homogenies. the result of the Shapiro-Wilk test showed that the data distribution was normal in aggression, depression, and anxiety variables of females aged 7-9 students with ADHD (P>0/05).

According to normal distribution of the study's information, the result of the variance analysis tests with the repeated measures, the mean difference of

the total depression score in two stages of pre-test and posttest (P=0/001, η2 = 0/557) between two groups of experimental and control and the group (P=0/035 η2=0/149) and time interaction effect (P=0/001, η2=0/561) was significant by 5 percent error rate (table 1). The result of the variance analysis test with repeated measures showed that the mean difference of anxiety level in pre-test and posttest (P=0/001, η2=0/678) between control and experimental group (P=0/006, n η2=0/239) and the group and time interaction effects (P=0/001, η2=0/663) was significant by 5% error rate (table 1). the results of the variance analyze test with repeated measures indicated that the mean difference of aggression of 2 stages and posttest and pretest (P=0/001, η2=0/790) between control and experimental group (P=0/004, η2=0/0254) and effect of group and time interaction (P=0/001, η2=0/763) was significant by 5% error rate (table 1).

Table 1: the change difference between intro and inter groups of depression, anxiety, and aggression and experimental and control groups.

variable	effect	SSE	Sum of squares	Degree of freedom	F	P	Eta square
Total depression scores	Intra-group	Error group	453/750	1	4/917	0/035*	0/149
		Time	2583/933	28			
	Inter-group	Time*error group	633/750	1	38/128	0/001*	0/577
			595/350	1	35/818	0/001*	0/561
			465/400	28			
Total anxiety scores	Intra-group	Error group	395/267	1	8/811	0/006*	0/239
		Time	1256/133	28			
	Inter-group	Time*error group	567/600	1	58/837	0/001*	0/678
			540	1	55/102	0/001*	0/663
			274/400	28			
Total aggression scores	Intra-group	Error group	2587/267	1	9/558	0/004*	0/254
		Time	7579/667	28			
	Inter-group	Time*error group	3588/267	1	105/088	0/001*	0/790
			3081/667	1	90/252	0/001*	0/763
			955/067	28			

Considering the inter group results and the data analysis the Tukey Post Hoc test was used to investigate the difference between inter group positions. The results of table 2 showed that the difference between control and experimental groups in depression (-5/500), anxiety (-5/133) and aggression (-13/133) variables was in a way that the difference of these variables was proved statistically (P<0/05). This means that the online body balance training effect was significant to reduce depression, anxiety, and aggression in control and experimental group; which this reduction was higher in experimental group (table 2).

Table 2: the results of the Tukey Post-Hoc test to investigate the difference between posttest variable between the two groups

Dependent Variable	Group Difference	Mean Differences	Standard Deviation	P-value	Confidence 95 Percent Upper Level	Interval Lower Level
Depression	Experimental-control	-5/500	2/480	0/035*	-10/581	-0/419

Anxiety	Experimental-control	-5/133	1/729	0/006*	-8/676	-1/591
aggression	Experimental-control	-13/133	4/248	0/004*	-21/835	-4/431

4. Discussion and Conclusion

The present study was accomplished for the purpose of examining the effect of 8 weeks online body balance training on depression, anxiety, and aggression of children with ADHD. Generally, the results of this study stated that using body balance training was effective in decreasing depression, anxiety and aggression in children aged 7-9 with ADHD. To a certain extent that the gathered means of experimental group questionnaires in posttest was dramatically lower than the control group. Previous studies indicated that sports training in different levels are useful for children and they stated that Yoga and Aerobics have a great effect on ameliorating ADHD (14, 23, and 24).

Sabzevari et al (2020) stated the use of combining sport and music as an effective interference to reduce anxiety, depression and ADHD of Elementary children (21). As maintained by AdlParvar et al (2017), it was deduced that Yoga can be a go-between variable to reduce the anxiety of children with ADHD (38). Nazer et al (2017), expressed that sport therapy or game therapy can be a supplementary treatment to decrease the symptoms of children with ADHD (39). James Palmer et al (2020) mentioned Yoga in a reviewed research as an interference way to reduce anxiety and depression in children and teenagers, and conducted that Yoga, regardless of the health status and interference features, can abate anxiety and depression among young people (23). Zang (2019), declared a reviewed study that sports training has a significant role in enhancing anxiety and depression, aggressive behaviors, and social issues in children with ADHD. Therefore, physical training must be included in children with ADHD lifestyles (40). Cornelius et al (2017), studies showed that daily activities have a positive and fundamental effect on children with ADHD cognitive and behavioral issues, and can control the symptoms of ADHD (41). In line with the abovementioned studies about sports and physical training in children with ADHD, this study demonstrated interference training (8 weeks online body balance training) can reduce depression, anxiety, and aggression in children with ADHD. Nevertheless, the results of this examination was novel by using online body balance training.

Body balance is a sport adopted from Yoga which the sports movements are like Tai Chi and Pilates. This training can strengthen muscles and improve the body and muscles' flexibility. Moreover, it can cut down stress and entail mental health (42). Generally, Yoga's advantages can be abridged in empowering muscles, increasing flexibility of body and muscles, helping articulation movements, reducing stress, mental health recovery, physical calmness, controlling anger, mental balance, increasing body metabolism, losing weight and fitness (42). Needless to say, Tai Chi emphasizes on producing energy by movements and this Chinese martial art can be effective on enhancing health, increasing lifetime and mental calmness (25). Yoga is a sport field that fosters effective and cognitive aspects of mine and its purpose is to reduce physical and mental tensions and make body and mind relax and calm, and Pilates is a sport that focuses on flexible progressing and strengthening the body parts (43). The mixture of these 3 sports with the goal of relaxation and meditation is a different way and it can obligated body and make it calm. A research by Bordbari Azari clarified that body balance training can have a positive effect on sportswomen by controlling depression (44).

Using body balance training was not massively used in previous studies. there was limited research about training in different areas, the use of body balance training on the physical fitness variable among mental retarded children (26), the effect of the this training on the elderly's life quality and balance (27), the effect of body balance training on body movements of people with apoplexy (28), and the body balance training on the extremeness of backache among pregnant females (45). In general, the result of these studies were supported by the effectiveness of this training on physical and mental variables. In spite of the ever increasing development of science and sports, training will provide an opportunity for researchers to examine these methods for all groups of people, and in this research, the role of using this training has been proved among children with ADHD to reduce the hyperactivity symptoms of depression, anxiety, and aggression.

In many studies, there were different demonstrations of the role of using Yoga in people with ADHD which is itself a part of body balance training interference. Chimikis et al (2018), stated a reason for systematic and reviewed Yoga interference that meditation and mind awareness can be beneficial for people with ADHD. But there needs to be countless research to confirm these interferences (46). Yoga training in this study probably has been one of the main reasons for decreasing mental disorders such as anxiety, depression, and aggression by making basal ganglia smaller, especially the caudate nucleus in ADHD might be a reason for lack of hindrance in responses and among these children, because of the main core of hindrance in brain, which is named dopamine (47). it seems that in this study, Yoga training caused higher level of dopamine and as a result, the regular

activity of basal ganglia can perform better. After all, it increases the hindrance response by normalization of hindrance action, the ADHD decrease among children that is subsequently, related to aggression and anxiety (48).

Body balance training provides environmental relationships by creating a happy and dynamic atmosphere for children and performing and participating in this physical in group activity, can enhance imitation among children which is helpful for their social interaction. One possibility to reduce depression, anxiety, and aggression might be the exudation of the endocrine gland that causes mental calmness, since physical activity can cause exudation of normal opioid which relaxes the body.

Some studies have shown that stress and pressure are some reasons for stimulating brainstem (49) and announcing ADHD in children. The yoga training used in body balance training interferences can reduce stress, relax individuals, reduce ADHA and enhance responses hindrance among children with ADHD (50). According to relaxing principle, yoga can destroy tension of muscles and make the muscles calm and relax and eventually enhance impulsivity (51). Moreover, it can increase the alpha band and decrease heart beats and breathing, which these activities can reduce impulsivity. In this case, it reveals that stress can release cortisol and cortisol can harm memory and constrict memory centers in brain. The participants in physical activities can control stress and anxiety by doing stretching activities and relaxing training and avoid releasing cortisol in body (52). In contrast, physiological changes of body such as setting blood stem and heart-veins machine by physical activities (body balance training) can be beneficial for relaxing and relaxation, and help children with ADHD. Consistent with the abovementioned data, researchers supported the hypothesis of using body balance training in reducing anxiety, depression, and regression among children with ADHD which the need of developing the application of this study, is crucial for people to achieve exact and reliable results. furthermore, it should be expressed that since the control group did not expose to the exports training and was devoid of the possible benefits of body balance training ,not the same as the experimental group, the lack of observation in reducing mental disorders such as anxiety, depression, and aggression in children with ADHD seems logical. The possible explanation would be in this way that if this group does not expose to the specific training with exact purposes, there won't be any recovery in such disorders and in the future, it might be increased. This is needed to be considered and applied appropriately in order to control the attention deficit/hyperactivity disorder symptoms among children with ADHD.

According to the results of the present study, 8 weeks of online training of body balance can reduce aggression, anxiety, and depression in children aged 7-9 with ADHD. Therefore, enhancing mental disorder caused by this disease in children followed by body balance training emphasized on the importance of using this interferences among children with ADHD. According to the positive effects of body balance training, it is suggested to use this method along with chemotherapy and consider the necessity of being familiar with these methods by parents, teachers, and special schools. moreover, there is a suggestion for investigating the research plans similar to this present to study about variables such as balance, life quality, sleeping quality, body mass index, blood pressure, body fat and physical fitness of people with ADHD and examine the effectiveness and permanence of body balance training interference with other interferences of these people.

Following Ethical Principles in Research

In the present study all, the tastes had complete approval and they entered the research after responding to the approval form. After starting the measurements, the purpose of the study, procedure and how to respond to the questionnaires completely has been explained to participants (parents and students with ADHD) and ensured that all the personal information and files will be only at researchers' disposal. The tastes were not forced to continue to associate. Furthermore, confidentiality principal about all information was taken into consideration.

Sponsors

This article is adopted from a thesis of the foremost writer from psychology-sports department of literature and humanities Institute in international University of Imam Reza.

Writers Association

Designing and the idea of this study, analyzing and interpreting the data, handwritings, professionally evaluating the handwritings, regarding scientific

concepts, confirming final handwritings, gathering data, and maintaining the unity of accomplishing the research from the beginning up to publishing and responding to the juries' comments: all writers.

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دوره ۳ - شماره ۲ - بهار ۱۴۰۲ (۵۴۳-۵۳۳)

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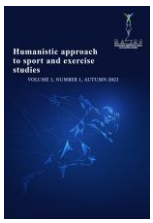

تأثیر هشت هفته برنامه آنلاین تعادل بر اضطراب، افسردگی و پرخاشگری کودکان مبتلا به اختلال نقص توجه/بیش فعالی

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دریافت: ۱۷ مرداد ۱۴۰۲

پذیرش: ۱۶ شهریور ۱۴۰۲

انتشار: ۲۴ شهریور ۱۴۰۲

چکیده: در طول همه گیری کووید-۱۹، استفاده از برنامه های ورزشی آنلاین رایج شد. هدف از این مطالعه بررسی تأثیر هشت هفته برنامه تعادل بدن آنلاین بر اضطراب، افسردگی و پرخاشگری کودکان مبتلا به اختلال نقص توجه/ بیش فعالی (ADHD) بود. تعادل بدن ورزشی مبتنی بر یوگا، تای چی و پیلاتس است. پژوهش حاضر از نوع نیمه تجربی و کاربردی بود. شرکت کنندگان در پژوهش حاضر ۳۰ کودک داوطلب مبتلا به ADHD بودند که به روش انتساب تصادفی به دو گروه آزمایش (۱۵ نفر) و کنترل (۱۵ نفر) تقسیم شدند. متغیرهای پرخاشگری، افسردگی و اضطراب با استفاده از پرسشنامه باس و پری، پرسشنامه افسردگی کودکان ماریا کواس و مقیاس اضطراب آشکار کودکان مورد ارزیابی قرار گرفتند. گروه آزمایش به مدت ۸ هفته (۳ جلسه در هفته به مدت ۶۰ دقیقه) به صورت آنلاین تمرین تعادل بدن را به صورت آنلاین و گروه کنترل فعالیت های فعلی خود را انجام دادند. به منظور بررسی تفاوت های درون گروهی و بین گروهی، از آنالیز واریانس با اندازه گیری های مکرر در سطح خطای ۰,۰۵ توسط نرم افزار SPSS استفاده شد. نتایج نشان داد که میانگین سطح علائم افسردگی، اضطراب و پرخاشگری در مرحله پیش آزمون و پس آزمون (P۰/۰۵≥)، بین دو گروه کنترل و آزمایش (P۰/۰۵≥) و تعامل معنی دار بود. اثر زمان و گروه (P≤0.05). نتایج آزمون توکی نشان داد که در متغیرهای علائم افسردگی (۵/۵۰۰-)، علائم اضطراب (۵/۱۳۳-) و علائم پرخاشگری (۱۳/۱۳۳-) این علائم بین دو گروه آزمایش و کنترل کاهش معناداری داشت. بر اساس نتایج این پژوهش، هشت هفته تمرین تعادل بدنی باعث کاهش علائم افسردگی، پرخاشگری و اضطراب در کودکان ۹-۷ ساله مبتلا به اختلال نقص توجه/بیش فعالی شد. بنابراین بهبود اختلالات روانی ناشی از این بیماری در کودکان با پیروی از برنامه تمرینی تعادل بدن، اهمیت استفاده از این روش مداخله ای را برای کودکان مبتلا به ADHD مورد تاکید قرار می دهد.

واژه‌های کلیدی: تعادل ، بیش فعالی، اضطراب، افسردگی، پرخاشگری.