YOGA FOR EMOTIONAL CONTROL IN CHILDREN WITH ADHD

YOGA NO CONTROLE EMOCIONAL EM CRIANÇAS COM TDAH

YOGA PARA EL CONTROL EMOCIONAL EN NIÑOS CON TDAH

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ABSTRACT

Introduction: Attention deficit hyperactivity disorder (ADHD) is one of the most common childhood disorders, with several negative social and behavioral consequences. Yoga shows appropriate efficacy in different conditions but is poorly explored during childhood. Objective: Analyze the efficacy of yoga in regulating emotions and symptoms in children with ADHD. Methods: This experimental study followed up on a control group of 30 children with ADHD. They were randomly allocated group into control (N=15) and experimental (N=15) through the block randomization method. Participants completed the emotion regulation and Conner scale (CBRS) before, after, and 60 days after yoga exercise (20 sessions twice a week). Results: After 8 weeks of training, participants' emotion regulation and ADHD symptoms improved significantly. The improvement in emotion regulation and ADHD symptoms was maintained at follow-up. Conclusion: Yoga training proved to be an easy and inexpensive method to improve the mental and physical condition of children with ADHD. ***Level of evidence II; Therapeutic studies - investigating treatment outcomes.***

Keywords: Attention Deficit Disorder with Hyperactivity; Yoga; Exercise; Child.

RESUMO

Introdução: O transtorno de déficit de atenção com hiperatividade (TDAH) é conhecido como um dos transtornos infantis mais comuns, com várias consequências sociais e comportamentais negativas. A ioga demonstra eficácia apropriada em diferentes condições, porém é pouco explorada durante a infância. Objetivo: Analisar a eficácia da ioga na regulação das emoções e sintomas de crianças com TDAH. Métodos: Este estudo experimental efetuou o acompanhamento em um grupo-controle realizado em 30 crianças com TDAH. Foram alocados, aleatoriamente, grupo em controle (N=15) e experimental (N=15) através do método de aleatorização em bloco. Os participantes completaram a regulação emocional e a escala de Conner (CBRS) antes, depois e 60 dias após o exercício de yoga (20 sessões duas vezes por semana). Resultados: Após 8 semanas de treinamento, a regulação das emoções dos participantes e os sintomas de TDAH melhoraram significativamente. A melhoria da regulação das emoções e dos sintomas de TDAH foi mantida no acompanhamento. Conclusão: O treinamento em ioga demonstrou-se um método fácil e econômico para melhorar a condição mental e física das crianças com TDAH. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

***Descritores*:** *Transtorno do Deficit de Atenção com Hiperatividade; Yoga; Exercício Físico; Criança.*

RESUMEN

Introducción: El trastorno por déficit de atención e hiperactividad (TDAH) es conocido como uno de los trastornos más comunes de la infancia, con varias consecuencias sociales y conductuales negativas. El yoga muestra una eficacia adecuada en diferentes condiciones, sin embargo, está poco explorado durante la infancia. Objetivo: Analizar la eficacia del yoga en la regulación de las emociones y los síntomas en niños con TDAH. Métodos: Este estudio experimental hizo un seguimiento de un grupo de control de 30 niños con TDAH. Se asignaron aleatoriamente grupos de control (N=15) y experimentales (N=15) mediante el método de aleatorización por bloques. Los participantes completaron la escala de regulación de la emoción y de Conner (CBRS) antes, después y 60 días después del ejercicio de yoga (20 sesiones dos veces por semana). Resultados: Tras 8 semanas de entrenamiento, la regulación de las emociones y los síntomas del TDAH de los participantes mejoraron significativamente. La mejora en la regulación de las emociones y los síntomas del TDAH se mantuvieron durante el seguimiento. Conclusión: El entrenamiento de yoga demostró ser un método fácil y barato para mejorar la condición mental y física de los niños con TDAH. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

***Descriptores*:** *Trastorno por Déficit de Atención con Hiperactividad; Yoga; Ejercicio Físico; Niño.*

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INTRODUCTION

Behavioral disorders are one of the most common and debilitating psychological problems in children. Attention Deficit Hyperactivity Disorder is one of these disorders that affects a wide range of children. The high prevalence of the disorder and its increasing trend has always been a matter of debate and concern.[1] Emotion control and regulation considered as the most common problems of these children are problems of emotion control and regulation and deficits in skills.[2] Some researchers believed that may be due to an imbalance of neurotransmitter receptors or dysfunction of the frontal lobe of the brain to control attention and orientation.[3] The frontal lobe plays an important role in controlling coordination of movement and impulsivity. Neurologic studies showed in children with ADHD, blood flow and energy expenditure in the frontal lobe of the brain have been reduced.[4] Decreased levels of serotonin and dopamine is also seen in ADHD children which potentially imbalance the mood.[5]

The abnormal conditions in the cerebral cortex, neural connections, and electrophysiology of the brain also mentioned as resean of emotion regulation difficulties.[6] These leads negative academic, behavioral, social, and emotional consequences.[7] ADHD treatment includes medications and behavioral interventions. Unfortunately, all children don't respond to medications.[8] Many parents are concerned about the side effects of medications such as tics, insomnia, and irritability, as well as their long--term safety.[9] Some children do not have access to behavioral therapies. Therefore, non-medication treatments are preferable in this case. Interventions that are applicable in this group of children should be attractive enough for ADHD cases. These children have a strong tendency to move and are not able to sit for long periods and concentrate on complex interventions. On the other hand planned movements lead to plasticity and new synapses in the brain.[10] Therefore, yoga as a complementary therapy can be a good option for these children. However, no study found yoga for ADHD cases emotion regulation. There are studies that show that yoga training has had positive effects in hyperactive children. Therefore, this study aimed to investigate the effectiveness of yoga training on emotion regulation of children with hyperactivity.

METHODS

Research method

This research was conducted by quasi-experimental method with pretest-posttest design and control group. In this study, the independent variable was yoga and the dependent variable was emotional control. The study was conducted in accordance with the Declaration of Helsinki. The participants signed the Free and Informed Consent Form (EHIC) for this work.

Objects

The statistical population included all children referred to the Children Behavioral Disorders Center in China. Inclusion criteria included the following: Age between 6-8 years; Have been diagnosed by a psychiatrist as an overactive child; Intermediate IQ; Living with both parents; Lack of traumatic experience in the last six months, such as the death of others; No physical or mental illness.

Exclusion criteria: Absence from more than one session; having an acute illness during the study; Termination of cooperation; Consumption of psychiatric medication;

Lack of cooperation in completing the questionnaire or doing exercises

Participants were selected by convenience sampling method and randomly assigned to two groups of yoga (n = 15) and control (n = 15). Both groups completed the children's emotional regulation questionnaire. The experimental group then participated in yoga sessions. During this period, the control group did not receive any treatment or psychological training from the research team. After the intervention and one month after the intervention, the participants completed the children's emotional regulation questionnaire. In order to observe ethical considerations, after the completion of the research, among those who were in the control group, those who wished to participate in yoga training sessions**.**

Instruments

The Emotional Regulation Checklist (Child and Adolescent Form) is a 24-item self-report scale that has both positive and negative items and was developed by Shield and Kicketti (1998). This item examines the core of emotional regulation and excitability, including emotional competence, emotional strength, flexibility, intensity, and the situational disproportion of emotional manifestations. Each item contains a 4-point Likert scale, rated from one (usually) to four (never).

They are divided into two subscales: emotion regulation through three emotions and eight-item instability/negativity, which measures emotionally appropriate emotional manifestations, empathy, and emotional self-awareness. Higher scores indicate greater capacity to manage and modulate an individual's emotional arousal. The Instability/Negativity subscale consists of 15 items that measure inflexibility, maladaptation, negative emotion, unpredictability, and sudden mood swings. Higher scores indicate extreme emotional reactions and mood swings that are unrelated to external events or stimuli.[11] Validity and reliability: In a study conducted to assess the validity of the questionnaire by Molina et al., Cronbach's alpha was 0.90 for instability/negativity and 0.79 for emotion regulation.[12]

Intervention

The intervention take place three times a week for twenty minutes during each session. The content of the sessions presented in the Table 1

Statistics

Data in SPSS20 statistical software described by descriptive statistical methods (mean, standard deviation, frequency, and percentage). The research hypotheses answered using inferential analysis (repeated measures analysis of variance).

Table 1. Exercise session.

Session	content
1th	Purpose and necessity of teaching yoga exercise, sessions, expectations, answering questions
2th	Introduce children, introduce, use ice-breaking techniques to connect members with the researcher and each other
3th	Teaching the technique of breathing through the mouth and nose
4th	Teaching breathing techniques with awareness of the selected method of breathing through the nose or mouth
5th	Concentration training with breathing and awareness while sitting and lying down
6th	Training body stretching and weight bearing exercises
7th	Practice training to bend the joule, bend backwards and bend sideways
8th	Performing combined postures with the lungs in a static position
9th	Perform combined postures with dynamic lung exercises
10th	Increase children's ability to raise awareness of body parts
11th	training to relax and reduce muscle tension
12th	Relaxation exercises for limbs by limbs
13th	exercises for fast and integrated body relaxation
14th	Exercises to focus on the word or shape with the eyes open
15th	exercises for focusing on blank paper with your eyes closed
16th	combined exercises of all stages and summaries

RESULTS

Demographic characters

The age of the participants was between 6-8 years. The mean age was 7.01 with a standard deviation of 0.84. The children were studying in preschool and primary schools. They had moderate intelligence based on Wegsler intelligence test (90-110). The age of the parents of the participants varied between 20-40 years.

Comparing demographic characters of groups

The demographic characteristics of the participants described and compared in Table 2.

The results of comparing the demographic status of the samples in groups show that the groups are not significantly different in terms of age of children and mothers (P <0.05).

Efficacy of intervention

The mean and standard deviation of the variables in the Table 3 show that the mean of the groups in the pre-test stage does not show difference. In the post-test stage, the scores increase in the intervention groups and no significant changes are seen in the control group. Result of repeated analysis of variance showed that the difference between the groups was significant p> 0.05; F = 21.72 and F=26.60 in subscales and total scores F=31.53 respectively. Based on ETA coefficients, it is determined that one of the interventions caused 43%, 48% and 53% more changes in total scores respectively.

The findings of the Table 4 show that there was a significant difference between the scores of post-test and follow-up in the treated group and while confirming the effectiveness of its stability in the follow-up.

DISCUSSION

After 8 weeks of training, the subject's emotion regulation and ADHD symptoms improved significantly. The improvement of emotion regulation and ADHD symptoms sustained in follow up. In another study, revealed that increasing experience (years of yoga practice) had a differential effect on the brain than did increasing weekly hours of yoga practice. Whole-brain regression analyses showed that more years of yoga experience was associated with increasing volumes in clusters located in the left insula, left frontal operculum, right middle temporal gyrus, while more hours devoted to yoga weekly was associated with increasing volumes in the left hippocampus, midline precuneus/PCC, and right V1 cortex.[10] Teaching yoga techniques improve mental health, quality of life of mental functions; Reduce stress and depression affect children. It is consistent with several findings. Explaining the results of the research, it can be said that yoga includes physical postures, breathing techniques, and meditation that connect the body, thoughts, and feelings with the awareness of the present moment. In relaxation and posture exercises physical appearance in teaching yoga to children who practice a variety of steps together, it helps children learn to cooperate**.** Other influential reasons that can lead to regulating the emotions of the people present in these classes can be attributed to the nature of yoga, namely attractiveness and special social influences. They pointed out to people that they can improve his level of self-esteem by promoting a positive relationship with others and creating a sense of self-worth**.**

Table 2. Comparison of demographic characteristics of participant's in groups.

	Variable	Yoga	Control	K-Square
		N (%)	N (%)	
Education	Below25	2(13.3)	6(35.7)	χ^2=6.97 P -value= 0.13
	25-35	12(80)	9(64.9)	
	Above 35 years old	1(6.7)	0	
Children	6	5(33.73)	2(14.3)	χ^2=5.91 P –value=0.43
	7	5(33.3)	9(64.3)	
	8	0	0	
Child AGE	Mean ±SD	32.66±6.76	34.14±4.78	F=0.75 P=0.47
Child AGE	Mean ±SD	6.92±1.55	6.06±1.31	F=0.80 P=0.45

Table 3. Analysis of variance and descriptive indicators in pre-test, post-test and follow-up.

Variables	Group	Pretest	Post Test		Follow-Up		Result			
		M	SD	M	SD	M	SD	F	P	eta
Instability of emotion	yoga	31.13	3.46	25.80	3.21	23.40	2.69	21.72	0.01	0.43
	control	31.80	2.54	31.86	2.82	31.46	3.04			
Inflexibility total score	yoga	29.26	2.43	24.33	2.63	21.93	2.37			
	control	31.06	3.08	30.80	3.89	31.20	3.70	26.60	0.01	0.48
	yoga	59.33	5.05	50.46	4.10	47.53	3.33			
	control	60.86	5.02	60.06	5.25	61.00	5.33	31.53	0.01	0.53

Table 4. Results of comparing the differences between the means in times.

variables	time	Post test		Follow up	
		MD	P	MD	P
instability of emotion	pretest	2.63	0.001*	4.03	0.001*
	Post test	-	0.001*	1.40	-
inflexibility	pretest	2.70	0.001*	3.70	0.001*
	Post test	-	-	1.000	0.001*
total score					

CONCLUSION

Combination of medication and complementary interventions is not a new concept in management of ADHD. However, children with ADHD are not ready to follow difficult rules of behavior therapy and mostly they are not able to sit during therapy sessions. Attention to ancient eastern therapies and medical integration showed good benefits in this study. Development of exercises based on children abilities is a main point of efficacy of this method. ADHD children are mostly have eating disorders also. Yoga excursive can promote both physical and mental health through fitness and emotion regulation. For ADHD children and their families who are under excessive pressure, the guidance of medical institutions on their pathological reactions is limited. Especially in recent years, the number of ADHD children in Chinese schools is gradually increasing, which leads to the decline of physical and mental health level year by year. It is urgent to improve the physical quality and health awareness of children in Chinese preschools. Schools pay too much attention to the enrollment rate, in order to improve students' performance, constantly compress the time of physical education curriculum, and extend students' learning time. This kind of behavior of the school will only increase burden of students' schoolwork, but also affect the healthy development of students' body and mind, and have a negative impact on students. Yoga training as an easy and cost effective method improve the mental and physical condition of children with ADHD.

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