

**90 - RECREATIONAL PRACTICES IN DEVELOPMENT OF A STUDENT'S MOTOR WITH ADHD**

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#### INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is a neurobehavioral disorder that results in attenuation of attention, characterized as a neuropsychiatric syndrome leading to inattention, hyperactivity and impulsivity to the various environments and the daily action of the subject for less (AMERICAN PSYCHIATRIC ASSOCIATION, 2013).

Hyperactivity has as its main symptom an excessive activity, making more difficult when starting a school life. This disorder must be diagnosed and treated, otherwise it may extend into adult life (IRONSIDE; DAVIDSON; CORKUM, 2010).

The lack of motor activity due to the absence of an educational system of tasks, can lead the individual with ADHD to several comorbidities, such as Motor Coordination Development Disorder (DCD) and Developmental Coordination Disorder (DDC) (KATZMAN et al., 2017).

The DSC - V (DSM - V) is a type of diagnosis for the type of association that falls within the first six symptoms of the syndrome and may vary the intensity of the disorder from individual to individual (AMERICAN PSYCHIATRIC ASSOCIATION, 2014; COSTA, MOREIRA, SEABRA JÚNIOR, 2015).

Individuals diagnosed with ADHD are subjected to academic learning tasks, leading to motor problems and difficulties in the establishing of relationships or friendship. The overload of exaggerated body activities causes learning difficulties and motor disturbances as an imbalance, eliminating the corporal problem, the space-time vision, lack of ability in psychomotor capabilities and consequent school failure (POETA; ROSANETO, 2004; RIBEIRO; DAMATTO, 2018).

Recreation is an indispensable tool that explores motor skills during play, manipulation of objects and participation in games without any learning process, providing benefits for the individual with ADHD, such as cooperation, interaction with the group, respect for rules, and establishment of interpersonal, motor perceptive, cognitive, social and academic relationships (TINTORI; BAST; PITTA, 2010; SILVA, DAMATTO, 2018).

The recreational practice it's a form of physical and/or mental activity, that arouse the individual interest and pleasure to do this type of activity, allowing the interaction with the environment in a spontaneous way, with less euphoria and less anxiety (BARKLEY, 2008; ORTEGA et al., 2018). The recreational practices can be applied actively, characterized by greater physical activity in the activities, or passive practiced by means of sensorial activities, interaction with the activity of the middle of the crowd, among others (GUERRA, 1996).

In addition, the realization of recreational activities is important for the individual in a warm, fun and full of possibilities, as well as the accomplishment of a series of tasks, stimulating a self-confidence and softening the feeling of incapacity (TINTORI; BAST; PITTA, 2010).

Inattention, hyperactivity and impulsivity are characteristic of all children, but in children with ADHD they occur exaggerated due to the neurochemical-nutritional imbalance, they are specific to neurotransmitters, specifically a dopamine and noradrenaline. This imbalance is regulated in a medicated way by the (Ritalina® and Concerta®), which alleviates disordered and compulsory motor behavior (MATOS et al., 2018). However, the reports of non-medicated treatments for ADHD are rare, and treatments involving recreational activities is very scarce. Thus, recreational activities were used to obtain benefits in the motor, affective and social aspects of ADHD patients.

The aim of this study was to verify if the development of recreational practices could improve the motor development in ADHD patients.

#### METHODS

The present study is a case report of a 14-year-old student with Attention Deficit Hyperactivity Disorder accompanied by the Multidisciplinary Pedagogical Support Center (CEAPEM) in the city of Itapeva - SP.

This research was realized according to the terms of Resolution 466/12 of the National Health Council. The study and the Term of Free and Informed Consent (TCLE) was explained to the responsible of the participant. The parents of the person responsible signed the TCLE, accepting the participation of their relative.

The follow-up period of observation of the activities was during four months, and the patients was evaluated at the initial moment, two months after the beginning and at the end of the period, by the Körperkoordinations Test Für Kinder (KTK) test. Test this compound for four tasks: balance beam, single-leg jumps, side jumps and lateral transfer (GORLA; ARAUJO; RODRIGUES, 2014). The activities performed during the observation period were applied recreationally and are classified as vertigo games and intellectual or ingenious (CUTRERA, 1993).

During the KTK test, the equilibrium and single-leg jumps tasks were observed for the dynamic balance and strength abilities of dominant or non-dominant lower limbs. In the lateral jumps task the velocity of the performer was observed in alternating the jumps realized with the feet together. The lateral transfer task sought to evaluate the laterality and spatial notion (SILVA JUNIOR, 2012; GORLA; ARAUJO; RODRIGUES, 2014).

The values presented in the motor quotients (QM) originated from the absolute values obtained in the accomplishment of each task of the KTK test. Furthermore, these values were related to the reference table of the original KTK test, which takes into account the performance obtained in the tasks and the age of the performer.

For the statistical analysis of the data, was used the Student's t test for dependent samples. The significance level considered was 5%.

#### RESULTS

The results were presented in scores obtained directly from the tests and, later, in motor quotients for each task (Table 1).

Table 1. Evaluate of motor skills.

	Score			MQ		
	1 <sup>a</sup> Evaluation	2 <sup>a</sup> Evaluation	Final Evaluation	QM 1 <sup>a</sup> Evaluation	QM 2 <sup>a</sup> Evaluation	QM Final Evaluation
Balance Trave	66	69	69	111	115	115*
Monopedal Jumps	12	12	14	22	22	24
Lateral Jumps	28	30	34	46	48	52
Lateral Transfer	18	22	27	36	40	46

MQ: Motor Quotients. Data expressed as average. Paired t test; \* P<0,05 vs baseline assessment.

In order to evaluate the general performance of the individual, the mean motor quotients before and after the period of recreational activities was performed. After the tests, was observed a significant increase in the motor quotient mean values in the evaluations performed at the end of the recreational activities protocol in comparison to the initial evaluation (initial evaluation 53.8 ± 39.4, final evaluation 59.3 ± 39.1, P < 0.05).

In the balance trave test, which evaluates the dynamic balance, was verified evolution in the results from the second evaluation, and there was a statistically significant improvement in the comparison between the initial and final moments of the stimulation by recreational activities (Figure 1A).

In the assessment of monopedal jumps, which evaluated the dynamic balance and the strength of the lower limbs, there was no improvement between the first and second evaluation in the obtained results, being that the evaluated one could not exceed the height of 30 cm in both tests. In the final evaluation, the individual managed to exceed the height of 35 cm, presenting improvement of approximately 10% when compared to the initial evaluation, however there was no statistically significant difference (Figure 1B).

In the lateral jumps test, which evaluates the speed of switching jumps performed with the feet together, was verified an increase in the number of jumps of 13% after performing the specific recreational activity compared to the initial test, but there was no significant difference between the initial and final tests. (Figure 1C).

In the lateral transfer test, which evaluates spatial notion and laterality, there was no statistically significant difference, although was verified an increase of 27% in this quotient, between the initial and final moments (Figure 1D).

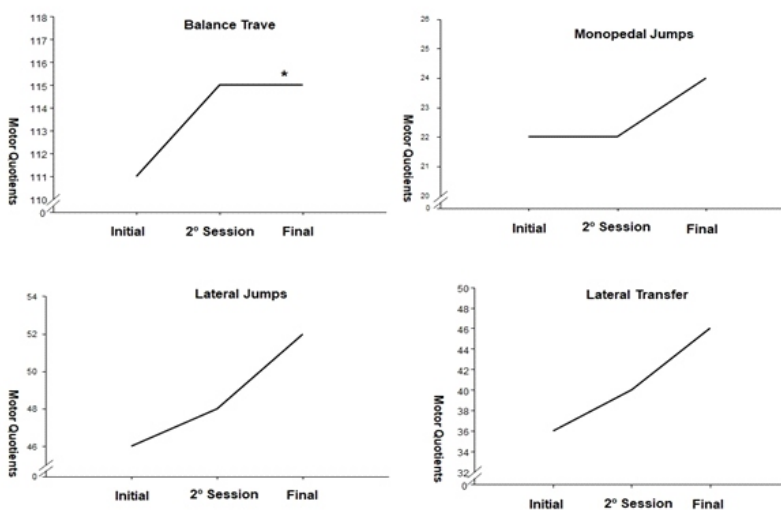


Figure 1. Performance charts in the KTK test evaluations. A: Evaluation of the balance test; B: Evaluation of single-heel jumps test; C: Evaluation of the lateral jump test; D: Evaluation of lateral transfer test. Paired t test; \* P < 0.05 vs baseline assessment.

DISCUSSION

The stimulation by means of varied activities, as observed in this case report, allows re-adaptation to movements, modifying the motor repertoire of patients with ADHD (GRECO; BENDA; CHAGAS, 1997). During the period of observation and evaluation of the individual performed several recreational activities involving balance, jumping, activities that use speed and laterality, and can influence several psychomotor aspects, among them, motor coordination, muscle tone, balance, laterality, space-temporal orientation.

In individuals with ADHD it's observed motor deficiency for activities that require mastery of balance. Such deficiencies are not always caused by deficiency in the musculature, but also lack of planning of the motor actions, since to carry out activities of balance, like the march in narrow surface, it is necessary to have body awareness and concentration. It is also observed that the practice improves these capacities. Corroborating with the literature, in our study we found an increase in the dynamic balance after the intervention period (PEREIRA; ARAUJO; MATTOS, 2005; GORLA; ARAUJO; RODRIGUES, 2014).

The tendency for the person with ADHD to develop problems of motor coordination is confirmed by the literature, showing that at least half of the students diagnosed with ADHD also have problems of motor coordination, affecting the accomplishment of motor tasks, such as jumps for example. (Larsson et al., 2007). The results of this study show that stimulation through recreational activities promoted a 10% increase in jump height, which reinforces the importance of the Physical Education professional in promoting motor practices, since they allow a learning environment, attenuating the difficulties and improving movement (FERNANDES et al., 2017).

Individuals with ADHD express variation of movement, although the velocity does not seem to be affected, however, it is observed that the precision is decreased (DEMERS; MCNEVIN; AZAR, 2013; FERNANDES et al., 2018). However, with adequate stimulation, the subject of this study presented a change in the velocity of realization, as well as alteration in laterality and spatial notion, evidenced by the increase in the number of jumps and lateral transfers between the initial and final

evaluations.

#### CONCLUSIONS

Patients with ADHD have motor difficulties, and a proper approach is necessary to provide better conditions for this public. In view of this, the recreational methodology emerges that provides a great contribution in the motricity of these individuals through a wide range of activities, being able to contemplate also social and cognitive aspects.

It was concluded that the stimulation through recreational activities in the student with attention deficit hyperactivity disorder provided an improvement in the motor development evidenced by the increase in the values obtained in the activity of the balance beam and in the average motor quotients. In addition, we observed evolution, although not statistically significant, in the motor quotients of single-sheeled jumps, lateral jumps and lateral transfer.

#### REFERENCES

- AMERICAN PSYCHIATRIC ASSOCIATION. Manual diagnóstico e estatístico de transtornos mentais DSM-5. 5. ed. Porto Alegre: Artmed, 2014.
- BARKLEY, R. A. Transtorno do déficit de atenção/hiperatividade– TDAH guia completo para pais, professores e profissionais da saúde. Porto Alegre: Artmed, 2002.
- BLEDSON, J.C.; SEMRUD-CLIKEMAN, M.; PLISZKA, S.R. Response inhibition and academic abilities in typically developing children with attention-deficit-hyperactivity disorder-combined subtype. *Archives of Clinical Neuropsychology*, p. 48, 2010.
- CAMARGO, F.T.S.O.; BRUEL, M.R. Psicomotricidade para portadores de transtorno de déficit de atenção e hiperatividade. *Saúde e meio ambiente: Revista Interdisciplinar*, v. 1, n. 2, p. 41-52, 2013.
- COSTA, C.R.; MOREIRA, J.C.C.; SEABRA JÚNIOR, M.O. Estratégias de ensino e recursos pedagógicos para o ensino de alunos com TDAH em aulas de educação física. *Revista Brasileira Educação Especial*, Marília, v.21, n.1, p.111-126, 2015.
- CUTRERA, J.C. Recreação. Florianópolis, Editora Ceitec; 1993.
- DA SILVA, J.; CONTREIRA, A.R.; CAPISTRANO, R.; BELTRAME, T.S. Desempenho motor de escolares com e sem transtorno de déficit de atenção/hiperatividade (TDAH). *Conscientiae Saúde*, v. 11, n. 1, p. 76-84, 2012.
- DEMERS, M.M.; MCNEVIN, N.; AZAR, N.R. ADHD and motor control: a review of the motor control deficiencies associated with attention deficit/hyperactivity disorder and current treatment options. *Critical Reviews in Physical and Rehabilitation Medicine*, v. 25, n. 3-4, 2013.
- FERNANDES, A. P.; MAIA, G.; SOUZA, T. A.; SILVA, P. C. R. Análise do exercício físico em crianças com transtorno do déficit de atenção e hiperatividade (tdah): uma revisão integrativa. *Revista da Sobama*, v.19, n.1, p.17-26, 2018.
- FERNANDES, A. P.; MIRANDA, D. M.; SILVA, P. C. R.; PEREIRA, D. A.; SALVADOR, M. G.; LAGE, G. M. Uma análise do desenvolvimento motor de crianças com transtorno do déficit de atenção e hiperatividade (TDAH). *Revista Educação Especial*, v. 30, n. 57, p. 115-128, 2017.
- FLIERS, E.; ROMMELSE, N.; VERMEULEN, S.H.H.M.; ALTINK, M.; BUSCHGENS, C.J.M.; FARAONE, S. V.; SERGEANT, J. A.; FRANKE, B.; BUITELAAR, J.K. Motor coordination problems in children and adolescents with ADHD rated by parents and teachers: effects of age and gender. *J. Neural Transm*, 2007.
- GORLA, J.I.; ARAÚJO, P.F.; RODRIGUES, J.L. Avaliação motora em educação física adaptada: teste KTK. 3 ed. São Paulo. Phorte, 2014.
- GRECO, P.J.; BENDA, R.N.; CHAGAS, M.H.. A aprendizagem do gesto técnico esportivo. GRECO, PJ; SAMULSKI, D.; CARAN JÚNIOR, E. Temas atuais em Educação Física e esportes. Belo Horizonte: Health, p. 45-58, 1997.
- GUERRA, M. Recreação e Lazer. 5. ed. Porto Alegre: Sagra, 1996.
- IRONSIDE, S.; DAVIDSON, F.; CORKUM, P. Circadian motor activity affected by stimulant medication in children with attention-deficit/hyperactivity disorder. *J. Sleep Res.* v. 19, p. 546–551, 2010.
- KATZMAN, M. A.; BILKEY, T. S.; CHOKKA, P. R.; FALLU, A.; KLASSEN, L. J. Adult ADHD and comorbid disorders: clinical implications of a dimensional approach. *BMC psychiatry*, n. 17, v. 1, p. 302, 2017.
- MATOS, H. P.; BATISTA, L. K. S.; FERREIRA, D. F. OLIVEIRA, M. L. M. C.; BATISTA, E. C.; MAGALHÃES, D. M. HumanÆ. Questões controversas do mundo contemporâneo, v. 12, n. 2, 2018.
- ORTEGA, J. T.; VIDAL, J. P.; BONAVENTURA, I. P.; IBÁÑEZ, V. V.; GIMÉNEZ, R. M.; NÚÑEZ, E. A.; DÍAZ, M. C. N.; BALLESCÁ, M. B. Diagnóstico y tratamiento de la fobia a tragar en la infancia y adolescência: Estudio de casos. *Revista de Psicología Clínica con Niños y Adolescentes*, v. 5, n. 1, p. 44-49, 2018.
- PALÁCIO, S.G.; VASCONCELLOS, A. Perfil Motor de Escolares com Transtorno de Déficit de Atenção/Hiperatividade Do Subtipo Predominantemente Desatento. *Saúde e Pesquisa*, v. 7, n. 2, 2014.
- PEREIRA, H.S.; ARAUJO, A.P.Q.C.; MATTOS, P. Transtorno do déficit de atenção e hiperatividade (TDAH): aspectos relacionados à comorbidades com distúrbios da atividade motora. *Revista Brasileira de Saúde Materna Infantil*, Recife, v. 5; 2005.
- POETA, L.S.; ROSA NETO, F. Estudo epidemiológico dos sintomas do transtorno do déficit de atenção/hiperatividade e transtornos de comportamento em escolares da rede pública de Florianópolis usando a EDAH. *Rev Bras Psiquiatr*; 26(3):150-155, 2004.
- RIBEIRO, E. A.; DAMATTO, R. L. O karatê como agente promotor de melhoras psicomotoras, acadêmicas, sociais e comportamentais no ambiente escolar. *FIEP Bulletin*, v. 88, p. 210-13, 2018.
- SILVA, L. C.; DAMATTO, R. L. Caracterização da compreensão de psicomotricidade por alunos de graduação em educação física. *FIEP Bulletin*, v. 88, p. 206-09, 2018.
- TINTORI, F.; BAST, D.F.; PITTA, M.R. Jogo na Terapia comportamental em grupo de crianças com TDAH. *Acta Comportamental*, v. 19, n. 2, p. 225-239, 2010.

**ABSTRACT:** The Attention Deficit Disorder and Hyperactivity Disorder (ADHD) is caused by a brain dysfunction, which may cause inattention, impulsivity and hyperactivity. Recreation is a tool that explores motor skills, interaction and cooperation among its participants. The aim of this study was to determine whether stimulation through recreational activities can improve the motor, social and affective aspects in patients with ADHD. The sample for this case report was a fourteen-year-old indicated by CEAPEM Itapeva - SP. Active recreation was used as a form of stimulation. Motor changes were evaluated by the KTK test (Körperkoordinations Test für Kinder). After application of the test it was observed changes in the coordinative standard participant between the start and end times, respectively ( $53.8 \pm 39.4$  vs  $59.3 \pm 39.1$ ;  $p < 0.05$ ). It is concluded that recreational approach acts beneficially on the symptomatic triad present in individuals with ADHD.

Keywords: Recreational activities; Motor coordination; Attention Deficit Disorder and Hyperactivity Disorder.

**RÉSUMÉ:** Le trouble déficitaire de l'attention et l'hyperactivité (TDAH) est provoqué par un dysfonctionnement du cerveau, causant inattention, impulsivité et hyperactivité. La récréation est un outil qui explore la motricité, l'interaction et la coopération parmi les participants. Le but de cet étude était de déterminer si la stimulation par les activités de loisirs pourrait améliorer les aspects moteur, social et affectif des patients atteints du TDAH. L'échantillon de cette déclaration de cas était un adolescent avec 14 ans, indiqué par CEAPEM Itapeva - SP. Les activités de loisir étaient utilisés comme une forme de stimulation. Les modifications motrices ont été évaluées par le test KTK (test de Körperkoordinations für Kinder). Après l'application du test, il a été observé des changements du niveau de coordination du participant entre l'heure de début et l'heure de fin, respectivement ( $53,8 \pm 39,4$  vs  $59,3 \pm 39,1$ ;  $p < 0,05$ ). Il est conclu que l'approche récréative a été bénéfique sur la triade symptomatique présente dans les personnes atteintes du TDAH.

**Mot-clés:** Activités de loisir; La coordination motrice; Trouble déficitaire de l'attention et hyperactivité.

**RESUMEN:** El Trastorno por Déficit de Atención e Hiperactividad (TDAH) es causada por una disfunción cerebral, que puede causar la falta de atención, impulsividad e hiperactividad. La recreación es una herramienta que explora las habilidades motoras, la interacción y la cooperación entre sus participantes. El objetivo de este estudio era determinar si la estimulación a través de actividades recreativas puede mejorar los aspectos motores, sociales y afectivos en pacientes con TDAH. La muestra para este caso clínico era un chico de catorce años de edad, indicado por CEAPEM Itapeva - SP. Recreación activa se utilizó como una forma de estimulación. Cambios de motor se evaluaron mediante la prueba KTK (Körperkoordinations für Kinder). Después se observó la aplicación de la prueba de cambios en el patrón de coordinación de los participantes entre los tiempos de inicio y final, respectivamente ( $53,8 \pm 39,4$  vs  $59,3 \pm 39,1$ ;  $p < 0,05$ ). Se concluye que el enfoque de recreo actúa beneficiosamente en la sintomática presente tríada en los individuos con TDAH.

**Palabras-Clave:** Actividades recreativas; Coordinación motora; Trastorno por Déficit de Atención e Hiperactividad.

**RESUMO:** O Transtorno de Déficit de Atenção e Hiperatividade (TDAH) é causado por uma disfunção cerebral, podendo ocasionar desatenção, impulsividade e hiperatividade. A recreação é uma ferramenta que explora habilidades motoras, interação e cooperação entre seus participantes. O objetivo deste trabalho foi verificar se a estimulação por meio de atividades recreativas pode melhorar os aspectos motor, social e afetivo de portadores de TDAH. A amostra para esse relato de caso foi um adolescente de quatorze anos de idade, indicado pelo CEAPEM de Itapeva - SP. Foi utilizada recreação ativa como forma de estimulação. As alterações motoras foram avaliadas pelo teste KTK (Körperkoordinations Test Für Kinder). Após a aplicação do teste observou-se mudanças no padrão coordenativo do participante entre os momentos inicial e final, respectivamente ( $53,8 \pm 39,4$  vs  $59,3 \pm 39,1$ ;  $p < 0,05$ ). Conclui-se que a abordagem recreativa atua beneficentemente sobre a tríade sintomática presente no indivíduo com TDAH.

**Palavras-Chave:** Atividade recreativa; Coordenação motora; Transtorno de Déficit de Atenção e Hiperatividade.