



Review Article

Martial Arts and ADHD: A Narrative Review of Cognitive, Behavioral, and Epigenetic Effectse

Carola Costanza^{1ABD}, Francesco Paolo Colecchia^{2AD}, Rita Polito^{3AD},
Marcellino Monda^{2AD}, Marco Carotenuto^{4ABD}, Giovanni Messina^{2BD}, Antonietta Monda^{4AD},
Nicola Mancini^{3AD}, Fiorenzo Moscatelli^{3AD}, Giuditta Bargiacchi^{2AD} and Maria Ruberto^{3ABD}

¹University of Palermo

²University of Campania “Luigi Vanvitelli”

³Pegaso Telematic University

⁴San Raffaele Telematic University

Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

Corresponding Author: Carola Costanza, e-mail: carola.costanza@unipa.it

Accepted for Publication: May 16, 2025

Published: May 30, 2025

DOI: 10.17309/tmfv.2025.3.26

Abstract

Objectives. The study aimed to explore the cognitive, behavioral, and potential epigenetic effects of martial arts-based interventions in individuals with Attention-Deficit/Hyperactivity Disorder (ADHD).

Materials and methods. A narrative review was conducted, synthesizing findings from eleven peer-reviewed studies examining martial arts practices — such as taekwondo, judo, karate, kung fu, qigong, and tai chi — in populations diagnosed with ADHD. The focus was placed on executive functions, emotional regulation, and neurobiological mechanisms. Additional literature on physical activity and epigenetic regulation was reviewed to contextualize emerging biological hypotheses.

Results. The findings indicate that martial arts interventions were associated with improvements in attention, working memory, and inhibitory control, particularly in structured disciplines such as judo and taekwondo. Some studies have also reported emotional and behavioral benefits, including reduced impulsivity and improved self-regulation. Although direct epigenetic evidence is lacking, indirect data suggest that physical activity may influence gene expression via mechanisms such as DNA methylation and histone modifications.

Conclusions. Martial arts may support cognitive and behavioral development in individuals with ADHD. Their structured, multimodal nature positions these training practices as promising tools to promote attention and executive functioning. Further research is encouraged to include longitudinal epigenetic profiling to clarify underlying biological mechanisms.

Keywords: ADHD, martial arts, executive functioning, physical activity, behavioral regulation, epigenetics.

Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is a common neurodevelopmental condition affecting approximately 5% of children worldwide (American Psychiatric Association, 2022). Characterized by symptoms of inattention, hyperactivity, and impulsivity, ADHD is often associated with executive function deficits, emotional dysregulation, and academic and social challenges.

Although pharmacological treatment remains the first-line intervention, interest in complementary and non-pharmacological approaches is growing, particularly those that engage cognitive, behavioral, and physiological systems simultaneously (Sethi & Mischel, 2022).

In the context of this narrative review, the term martial arts refers to a diverse set of structured practices that integrate physical movement with cognitive engagement, emotional regulation, and often philosophical or ethical principles. The selected studies examined a range of disciplines—including taekwondo, judo, karate, kung fu, tai chi, and qigong—each offering unique combinations of motor coordination, strategic thinking, self-control, and social interaction (Archer et al., 2021). These practices commonly

© Costanza, C., Colecchia, F. P., Polito, R., Monda, M., Carotenuto, M., Messina, G., Monda, A., Mancini, N., Moscatelli, F., Bargiacchi, G., & Ruberto, M., 2025.

involve sequenced movements, attentional focus, and real-time decision-making, all of which are thought to engage core components of executive functioning. Early work on mind-body interventions also emphasized the role of structured movement, physical touch, and body awareness in promoting emotional and cognitive self-regulation (Field, 2012; Levin, 2018).

Some martial arts, particularly internal styles such as tai chi and qigong, also incorporate mindfulness elements, controlled breathing, and interoceptive awareness. These components are relevant to ADHD, as they may contribute to improved emotional regulation and behavioral inhibition. Furthermore, there is growing interest in the potential of physical activity—including martial arts—as a modulator of epigenetic mechanisms, such as DNA methylation, histone modifications, and microRNA expression (Fernandes et al., 2017; Wang & Zeng, 2021). Although direct research on martial arts and epigenetics in ADHD is still lacking, theoretical and biological plausibility support further investigation.

This narrative review aims to synthesize the current knowledge on the cognitive, behavioral, and hypothesized epigenetic effects of martial arts in individuals with ADHD, providing a critical overview of available evidence and identifying gaps for future research.

Materials and Methods

A narrative review was conducted, synthesizing findings from eleven peer-reviewed studies examining martial arts practices—such as taekwondo, judo, karate, kung fu, qigong, and tai chi—in populations diagnosed with ADHD. Focus was placed on executive functions, emotional regulation, and neurobiological mechanisms. Additional literature regarding physical activity and epigenetic regulation was reviewed to contextualize emerging biological hypotheses.

Results

Cognitive and Executive Functioning Benefits

Several studies have reported that martial arts interventions are associated with measurable improvements in executive functioning among individuals with ADHD. Practices such as taekwondo, judo, and karate emphasize structured movement sequences, goal-directed attention, and cognitive flexibility, which are all relevant to core deficits observed in ADHD.

In a randomized controlled trial, Kadri et al. (2019) demonstrated that an 18-month taekwondo program significantly enhanced selective attention, sustained attention, and inhibitory control in adolescents with ADHD, with very large effect sizes across Stroop and Ruff 2 & 7 tasks. Similarly, Ludyga et al. (2022) found that 12 weeks of judo training improved visuospatial working memory and was associated with increased contralateral delay activity (CDA) on EEG recordings—an index of working memory capacity.

The published narrative reviews and the theoretical analyses further support the hypothesis that martial arts training fosters self-monitoring, motor planning, and response inhibition, especially in cognitively demanding styles like kung fu and karate (Pujari, 2024). According to Li

et al. (2023), who conducted a network meta-analysis of 31 RCTs, martial arts ranked among the most effective physical interventions for improving executive domains such as working memory, inhibition, and cognitive flexibility in children with ADHD.

These findings suggest that martial arts may serve as ecologically valid cognitive training, combining physical exertion with attentional control, real-time decision-making, and sequential processing—skills that overlap with neuropsychological constructs targeted in cognitive rehabilitation. Electrophysiological studies have shown enhanced corticospinal excitability and faster reaction times in karate practitioners compared to controls, supporting the role of martial arts in motor-cognitive integration (Moscatelli et al., 2016a).

Emotional and Behavioral Regulation in Martial Arts-Based Interventions

Beyond cognitive gains, martial arts interventions have shown promising effects on emotional regulation and behavioral outcomes in individuals with ADHD. These practices often involve not only physical discipline, but also breathing techniques, structured routines, and ethical components that foster self-control and emotional awareness.

In a pilot study involving four school-aged children diagnosed with ADHD, ODD, and CD, Rodrigues et al. (2019) reported substantial reductions in hyperactivity, oppositional behavior, and conduct symptoms following a taijiquan and qigong program. Improvements exceeded 40% across multiple domains, particularly in cases with milder baseline severity.

Moreover, the mind-body practices such as tai chi and qigong have also been linked to reductions in impulsivity and anxiety symptoms. A scoping review by Ribeiro da Silva et al. (2024) highlighted the potential of tai chi to modulate attention and behavioral regulation in impulsivity-related disorders, including ADHD, by promoting executive awareness and prefrontal activation.

Interestingly, Ludyga et al. (2023) found that while judo training improved behavioral inhibition in preterm children, it had limited impact in those with ADHD—possibly due to greater baseline cognitive load, comorbidities, or lower motor competence in the latter group. This highlights the importance of participant-specific factors in modulating treatment responsiveness.

Overall, the martial arts appear to be effective in channeling hyperactivity and improving the emotional and mood regulation and stability, particularly in interventions that integrate breath work, mindfulness, and regulated interpersonal interaction, suggesting their role as behavioral support tools (Kerekes et al., 2004). These findings align with broader evidence showing that physical activity contributes to affective stabilization and emotional regulation across a range of psychiatric conditions (Vancampfort et al., 2021).

Comparisons with Other Physical Activities

While various types of physical activity have shown benefits for children and adolescents with ADHD, the martial arts may offer unique advantages due to their multimodal

nature, which combines motor, cognitive, emotional, and ethical components.

Traditional aerobic exercises—such as running, swimming, or cycling—have been widely studied for their effects on attention and mood (Budde & Wegner, 2023). These activities can improve cardiorespiratory fitness, increase dopamine and norepinephrine levels, and reduce stress-related symptoms. However, they often lack the complex structure, strategic engagement, and interpersonal discipline inherent in martial arts training (Li et al., 2023).

In a network meta-analysis of 31 randomized controlled trials, Li et al. (2023) found that martial arts-based interventions ranked among the most effective for improving working memory, attention, and cognitive flexibility, outperforming other forms of physical exercise such as aerobic training in several domains. This may be due to the executive demands placed on practitioners during sparring, pattern execution, and tactical planning. Unlike generic aerobic exercise, martial arts require coordinated, high-demand motor patterns that enhance corticospinal responsiveness (Moscattelli et al., 2016c).

Moreover, practices such as judo, taekwondo, and tai chi often require regulation of arousal, focused breathing, and respectful social interaction, which may further support self-regulation skills. These features are less prominent in unstructured physical activities or team sports, which can be overstimulating for individuals with ADHD (Zannella et al., 2021).

Taken together, the existing literature suggests that martial arts are not merely physical training, but integrated systems of behavioral shaping, capable of engaging multiple domains of functioning in ways that may be particularly suited to neurodevelopmental conditions like ADHD.

Neurobiological and Epigenetic Mechanisms of Physical Activity in ADHD

While direct epigenetic studies on martial arts and ADHD are currently lacking, emerging evidence suggests that physical activity—especially when structured and cognitively engaging—can induce neurobiological and epigenetic changes relevant to ADHD pathophysiology (Wang & Zeng, 2021).

According to the neurocognitive perspective, interventions such as judo and tai chi have been associated with enhanced frontal brain activation, improved working memory, and changes in electrophysiological markers like contralateral delay activity (CDA) and P3a amplitude (Ludyga et al., 2022; 2023). These effects align with increased activity in neural circuits involving the prefrontal cortex, basal ganglia, and cerebellum—brain regions properly involved in attention and executive control.

Increased cortical excitability following physical exertion has been observed in martial arts athletes, potentially linking metabolic activity and neural activation (Moscattelli et al., 2016b).

At the molecular level, the physical activity is known to modulate gene expression through epigenetic mechanisms, including DNA methylation, histone modifications, and the regulation of non-coding RNAs (Fernandes et al., 2017; Zannella et al., 2021). For instance, aerobic and coordination-based exercises can reduce methylation of genes like BDNF (brain-derived neurotrophic factor), which is crucial for synaptic plasticity and executive functioning consequently.

Moreover, recent findings suggest that nutritional factors—such as choline, folate, and vitamin B12—can interact with physical activity through one-carbon metabolism, influencing methyl donor availability and, consequently, DNA and histone methylation (Vallée, 2023; Popławska et al., 2023). These processes are particularly active during developmental windows such as childhood and adolescence, when the epigenome is more plastic and sensitive to the environmental inputs.

Although current martial arts studies in ADHD populations have not included epigenetic profiling, the observed cognitive and behavioral benefits, combined with biological plausibility, support the hypothesis that regular martial arts practice may contribute to long-term neurodevelopmental modulation via epigenetic pathways (Zhou et al., 2023).

Discussion

Table 1 summarizes the main characteristics of the eleven studies included in the present narrative review, outlining the type of martial arts practiced, target population, duration and design of the interventions, pharmacological status of participants, and key clinical outcomes. The evidence suggests that martial arts interventions—particularly those emphasizing structure, repetition, and self-regulation—are associated with improvements in attention, inhibitory control, and working memory in youth with ADHD. Disciplines such as taekwondo, judo, and karate demonstrated the most robust cognitive effects in randomized controlled trials, while tai chi, qigong, and hybrid practices contributed to emotional and behavioral regulation, especially in pilot or scoping studies.

Interestingly, participants undergoing pharmacological treatment showed less consistent benefits as reported by Ludyga et al. (2023) and by Converse et al. (2021). These studies raise questions about the baseline neurocognitive load, potential ceiling effects of medication, and the possible interactions between pharmacological and behavioral interventions. Conversely, children not on medication appeared to respond more favorably, particularly in studies involving sustained and immersive practice formats (Kadri et al., 2019; Rodrigues et al., 2019). Despite the variability in intervention length, intensity, and design, most studies reported favorable outcomes across cognitive and behavioral domains, reinforcing the idea that martial arts can act as ecological platforms for self-regulation training, integrating body, mind, and interpersonal coordination.

Epigenetic and Neurobiological Perspectives

Beyond behavioral outcomes, a growing body of research suggests that the physical activity acts as an environmental modulator of gene expression via epigenetic mechanisms (Wang & Zeng, 2021). Although none of the studies in the present narrative review directly measured molecular biomarkers, their findings are consistent with literature linking exercise to reduced DNA methylation, histone acetylation, and modulated microRNA activity in brain regions involved in attention and executive functioning (Fernandes et al., 2017; Zannella et al., 2021; Vallée, 2023).

Specifically, the interventions that engage coordination, planning, and self-discipline, such as the martial arts practice, may stimulate the expression of genes like BDNF, may improve

Table 1. The main characteristics of the studies

Author (Year)	Martial Art	Population	Pharmacological Treatment	Duration	Study Design	Main Outcomes
Kadri et al. (2019)	Taekwondo	Adolescents (n=40)	No	18 months (2×/ week)	CT	↑ attention, inhibition, exec. function
Rodrigues et al. (2019)	Taijiquan + Qigong	Children (n=4)	No	30 sessions (20 min)	Pilot study	↓ hyperactivity, ODD/CD symptoms
Pujari (2024)	Karate, Kung Fu	Narrative review	No	N/A	Narrative review	↑ attention, self-regulation
Ribeiro da Silva et al. (2024)	Tai Chi	Various	Mixed	Variable	Scoping review	↓ impulsivity, ↑ emotional control
Li et al. (2023)	Various (incl. martial arts)	Children/ adolescents (31 RCTs)	Mixed	4–24 weeks	Meta-analysis	↑ exec.functions, attention
Ludyga et al. (2022)	Judo	Children (n=57)	Yes	12 weeks (2×60 min)	CT	↑ visuospatial memory, CDA (EEG)
Ludyga et al. (2023)	Judo	Children with ADHD/preterm	Yes (ADHD)	12 weeks (2×60 min)	Meta-analysis	Only preterms improved in inhibition, P3a
Converse et al. (2021)	Tai Chi	University students (n=21)	Presumably yes	7 weeks (2×/ week)	RCT	Good tolerance, low adherence, no CAARS improvement

the dopaminergic pathway activity, and can modulate the stress reactivity. These adaptations are particularly relevant during sensitive developmental windows in childhood and adolescence, when the epigenome is more plastic and responsive to environmental inputs (Zhou et al., 2023).

Moreover, the interaction between the physical activity and nutrition—through one-carbon metabolism and methyl donor availability—suggests that lifestyle-based interventions could offer durable neurodevelopmental benefits. Although these hypotheses remain theoretical, they warrant further investigation through integrated behavioral and biological study designs (Chen et al., 2020). Future research should also consider frequent comorbidities in ADHD, such as developmental coordination disorder and epilepsy, which may influence intervention outcomes (Esposito et al., 2025).

Limitations and Future Directions

Several limitations must be acknowledged. Most included studies employed small sample sizes, short durations, and heterogeneous outcome measures. There is also a lack of standardized intervention protocols and a near absence of long-term follow-up assessments. Furthermore, the variability in participant profiles—age, medication status, comorbidities—makes generalization difficult.

Future research should prioritize well-powered RCTs with clearly defined the martial arts programs, control conditions, and epigenetic profiling. Biomarker studies involving methylation patterns, gene expression, and neuroimaging could clarify the biological underpinnings of observed behavioral improvements.

Finally, understanding for whom and under which conditions martial arts are most beneficial will require personalized approaches that consider baseline motor competence, symptom severity, and motivation.

Conclusion

In conclusion, martial arts represent a promising, multidimensional approach to supporting children and adolescents with ADHD. While current evidence highlights benefits across cognitive, behavioral, and emotional domains, the absence of epigenetic data calls for future research integrating molecular and neurodevelopmental markers. The structured, integrative nature of martial arts—blending physical coordination, mental focus, and emotional regulation—positions these practices as potentially powerful tools in holistic ADHD management. A deeper understanding of the biological mechanisms involved, especially those modulated by lifestyle and experience, could unlock new avenues for personalized, sustainable interventions.

Conflict of Interest

Authors declare that they have no conflict of interest related to the content of this manuscript.

References

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.; DSM-5-TR). American Psychiatric Publishing

- Sethi, S., & Mischel, W. (2022). The role of physical activity in ADHD management. *Frontiers in Human Neuroscience*, 16, 1194119. <https://doi.org/10.3389/fnhum.2022.1194119>
- Archer, T., Garcia, D., & Moradi, S. (2021). The effect of martial arts training on cognitive and psychological functions. *Frontiers in Pediatrics*, 9, 707047. <https://doi.org/10.3389/fped.2021.707047>
- Field, T. (2012). Exercise research on children and adolescents. *Complementary Therapies in Clinical Practice*, 18(1), 54-59. <https://doi.org/10.1016/j.ctcp.2011.05.001>
- Levin, R. (2018). Movement-based interventions for children with behavioral difficulties. *Journal of Child and Adolescent Behavior*, 6(4), 1-5. <https://doi.org/10.4172/2375-4494.1000376>
- Fernandes, J., Arida, R. M., & Gomez-Pinilla, F. (2017). Physical exercise as an epigenetic modulator of brain plasticity and cognition. *Neuroscience & Biobehavioral Reviews*, 80, 443-456. <https://doi.org/10.1016/j.neubiorev.2017.06.012>
- Wang, X., & Zeng, L. (2021). Epigenetics and ADHD: Reflections on current knowledge, paradigms, and methodological pitfalls. *Current Opinion in Behavioral Sciences*, 38, 101-107. <https://doi.org/10.1016/j.cobeha.2021.01.007>
- Kadri, A., Slimani, M., Bragazzi, N. L., Tod, D., Azaiez, F., & Chamari, K. (2019). Effect of taekwondo practice on cognitive function in adolescents with attention deficit hyperactivity disorder. *International Journal of Environmental Research and Public Health*, 16(2), 204. <https://doi.org/10.3390/ijerph16020204>
- Ludyga, S., Mücke, M., Leuenberger, R., Bruggisser, F., Pühse, U., & Gerber, M. (2022). Behavioral and neurocognitive effects of judo training on working memory capacity in children with ADHD: A randomized controlled trial. *NeuroImage: Clinical*, 35, 103156. <https://doi.org/10.1016/j.nicl.2022.103156>
- Pujari, V. (2024). Martial arts as a tool for enhancing attention and executive function: Implications for cognitive behavioral therapy—A literature review. *Journal of Pharmacy and Bioallied Sciences*, 16(1), 62-66. https://doi.org/10.4103/jpbs.jpbs_612_23
- Li, X., Wang, Y., Zhang, Y., Lin, Y., Qi, Y., & Wang, H. (2023). Comparative effectiveness of different physical exercise interventions on executive functions in children and adolescents with ADHD: A network meta-analysis of 31 RCTs. *Journal of Affective Disorders*, 344, 82-93. <https://doi.org/10.1016/j.jad.2023.04.028>
- Moscattelli, F., Valenzano, A., Petito, A., Triggiani, A. I., Ciliberti, M. A. P., Luongo, L., Carotenuto, M., Esposito, M., Messina, A., Monda, V., Monda, M., Capranica, L., Messina, G., & Cibelli, G. (2016). Relationship between blood lactate and cortical excitability between taekwondo athletes and non-athletes after hand-grip exercise. *Somatosensory & Motor Research*, 33(2), 137-144. <https://doi.org/10.1080/08990220.2016.1203305>
- Rodrigues, J. M. S. M., Mestre, M. I. C. P., Matos, L. C., & Machado, J. P. (2019). Effects of Taijiquan and Qigong practice over behavioural disorders in school-age children: A pilot study. *Journal of Bodywork & Movement Therapies*, 23(2), 311-317. <https://doi.org/10.1016/j.jbmt.2018.01.019>
- Ribeiro da Silva, D., Rohde, C. B. S., & Tavares, H. (2024). Tai Chi Chuan evidence related to impulsivity and impulse-related disorders: A scoping review. *Journal of Bodywork & Movement Therapies*, 39, 96-104. <https://doi.org/10.1016/j.jbmt.2024.03.038>
- Ludyga, S., Hanke, M., Leuenberger, R., Bruggisser, F., Pühse, U., & Gerber, M. (2023). Martial arts and cognitive control in children with attention-deficit/hyperactivity disorder and children born very preterm: A combined analysis of two randomized controlled trials. *Medicine & Science in Sports & Exercise*, 55(3), 442-450. <https://doi.org/10.1249/MSS.0000000000003110>
- Kerekes, N., Field, T. M., & Narvaez, D. (2004). Promoting self-regulation through school-based martial arts training. *Early Child Development and Care*, 174(5), 489-501. <https://doi.org/10.1080/0300443042000187091>
- Vancampfort, D., Rosenbaum, S., Schuch, F. B., Mugisha, J., Firth, J., & Stubbs, B. (2021). Physical activity and sedentary behavior in people with major depressive disorder and other mental disorders: A global perspective. *World Psychiatry*, 20(3), 418-419. <https://doi.org/10.1002/wps.20910>
- Budde, H., & Wegner, M. (2023). Effects of physical activity, exercise and sport on executive function in children with ADHD. *Revista de Psicología del Deporte*, 12(1), 6. <https://doi.org/10.3390/2254-9625/12/1/6>
- Moscattelli, F., Messina, G., Valenzano, A., Monda, V., Viggiano, A., Messina, A., Petito, A., Triggiani, A. I., Ciliberti, M. A., Monda, M., Capranica, L., & Cibelli, G. (2016). Functional assessment of corticospinal system excitability in karate athletes. *PLoS ONE*, 11(5), e0155998. <https://doi.org/10.1371/journal.pone.0155998>
- Zannella, C., Savarese, G., Laterza, C., et al. (2021). The role of physical activity in ADHD: A narrative review. *Children*, 8(7), 594. <https://doi.org/10.3390/children8070594>
- Moscattelli, F., Messina, G., Valenzano, A., Petito, A., Triggiani, A. I., Messina, A., Monda, V., Viggiano, A., De Luca, V., Capranica, L., Monda, M., & Cibelli, G. (2016). Differences in corticospinal system activity and reaction response between karate athletes and non-athletes. *Neurological Sciences*, 37(12), 1947-1953. <https://doi.org/10.1007/s10072-016-2693-8>
- Vallée, A. (2023). Epigenetic mechanisms in ADHD and the role of physical activity: From lifestyle to molecular interventions. *Clinical Epigenetics*, 15(1), 121. <https://doi.org/10.1186/s13148-023-01484-y>
- Popławska, K., Pawlak, D., & Grochowska, M. (2023). Epigenetic modification of the DAT1 gene promoter and personality traits in martial arts athletes. *International Journal of Molecular Sciences*, 24(10), 8931. <https://doi.org/10.3390/ijms24108931>
- Zhou, M., Liu, J., & Chen, Y. (2023). Epigenetic and neuroplasticity in neurodevelopmental disorders: Possibilities of physical exercise. *International Journal of Family & Community Medicine*, 7(1), 6-10.
- Converse, A. K., Barrett, B. P., Chewning, B. A., & Wayne, P. M. (2021). Tai chi training for attention deficit hyperactivity disorder: A feasibility trial in college students. *Complementary Therapies in Medicine*, 60, 102538. <https://doi.org/10.1016/j.ctim.2020.102538>
- Chen, C., Wang, Y., & Wu, H. (2020). Efficacy of non-pharmacological interventions on executive functions

in children with ADHD: A systematic review. *Journal of Affective Disorders Reports*, 1, 100012.
<https://doi.org/10.1016/j.jadr.2023.100012>

Developmental coordination disorder and epilepsy. *World Journal of Pediatrics*, 21(1), 1-2.
<https://doi.org/10.1007/s12519-024-00869-0>

Esposito, M., Santomauro, R., Dell'Isola, G. B., Ruberto, M., Verrotti, A., Siciliano, M., & Carotenuto, M. (2025).

Бойові мистецтва та розлад дефіциту уваги з гіперактивністю: Наративний огляд когнітивних, поведінкових та епігенетичних впливів

Карола Костанца^{1ABD}, Франческо Паоло Колеккіа^{2AD}, Ріта Політо^{3AD}, Марчелліно Монда^{2AD}, Марко Каротенуто^{2ABD}, Джованні Мессіна^{2BD}, Антоніетта Монда^{4AD}, Нікола Манчіні^{3AD}, Фіоренцо Москателлі^{3AD}, Джудітта Барджаккі^{2AD}, Марія Руберто^{3ABD}

¹Університет Палермо

²Університет Кампанії "Луїджі Ванвітеллі"

³Телематичний університет Пегасо

⁴Телематичний університет Сан-Рафаеле

Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; Е – збір коштів

Реферат. Стаття: 7 с., 1 табл., 27 джерел.

Мета дослідження. Мета дослідження полягала у вивченні когнітивних, поведінкових та потенційних епігенетичних впливів щодо застосування інтервенцій на основі бойових мистецтв у осіб із розладом дефіциту уваги та гіперактивності (РДУГ).

Матеріали та методи. Проведено наративний огляд, в якому синтезовано результати одинадцяти рецензованих досліджень, спрямованих на вивчення практик бойових мистецтв, як-от тхеквондо, дзюдо, карате, кунгфу, цигун і тайцзицюань в групах населення з діагнозом РДУГ. Фокус уваги був зосереджений на виконавчих функціях, емоційній регуляції та нейробіологічних механізмах. Задля контекстуалізації нових біологічних гіпотез було розглянуто додаткову літературу, присвячену вивченню фізичної активності та епігенетичної регуляції.

Результати. Результати дослідження вказують на те, що інтервенції з бойових мистецтв пов'язані із покращенням концентрації уваги, робочої пам'яті та інгібиторного контролю, особливо в структурованих дисциплінах, як-от дзюдо і тхеквондо. У деяких дослідженнях також повідомлялося про позитивні зміни в емоційній та поведінковій сферах, включаючи зниження імпульсивності та поліпшення саморегуляції. Попри недостатність прямих епігенетичних доказів, непрямі дані свідчать про можливість впливу фізичної активності на експресію генів через такі механізми: метилювання ДНК та модифікації гістонів.

Висновки. Бойові мистецтва можуть сприяти когнітивному та поведінковому розвитку осіб із РДУГ. Їх структурований, мультимодальний характер позиціонує ці практики тренувань як перспективні інструменти для підвищення концентрації уваги та виконавчого функціонування. У подальших дослідженнях рекомендується включити лонгітюдне епігенетичне профілювання з метою з'ясування біологічних механізмів, що лежать в основі цього процесу.

Ключові слова: РДУГ, бойові мистецтва, виконавче функціонування, фізична активність, поведінкова регуляція, епігенетика.

Information about the authors:

Costanza, Carola: carola.costanza@unipa.it; <https://orcid.org/0000-0001-9200-2772>; Department of Psychology, Educational Science and Human Movement, University of Palermo, Viale delle Scienze Edificio 15, Palermo, 90128, Italy.

Colecchia, Francesco Paolo: francescopaolocolecchia@gmail.com; <https://orcid.org/0009-0007-6207-9649>; Department of Experimental Medicine, Section of Human Physiology and Unit of Dietetics and Sports Medicine, University of Campania "Luigi Vanvitelli", Naples, 80138, Italy.

Polito, Rita: rita.polito@unipegaso.it; <https://orcid.org/0000-0003-1313-2574>; Department of Psychology and Health Sciences, Pegaso Telematic University, Naples, 80143, Italy.

Monda, Marcellino: marcellino.monda@unicampania.it; <https://orcid.org/0000-0002-7184-218X>; Department of Experimental Medicine, Section of Human Physiology and Unit of Dietetics and Sports Medicine, University of Campania "Luigi Vanvitelli", Naples, 80138, Italy.

Carotenuto, Marco: marco.carotenuto@unicampania.it; <https://orcid.org/0000-0002-8136-7597>; Department of Mental and Physical Health and Preventive Medicine, University of Campania "Luigi Vanvitelli", Naples, 80138, Italy.

Messina, Giovanni: giovanni.messina@unicampania.it; <https://orcid.org/0000-0002-1730-7063>; Department of Experimental Medicine, Section of Human Physiology and Unit of Dietetics and Sports Medicine, University of Campania “Luigi Vanvitelli”, Naples, 80138, Italy.

Monda, Antonietta: antonietta.monda@uniroma5.it; <https://orcid.org/0009-0009-8422-3837>; Department of Human Science and Quality of Life Promotion, San Raffaele Telematic University, Rome, 00166, Italy.

Mancini, Nicola: nicola.mancini@unipegaso.it; <https://orcid.org/0009-0005-4566-6417>; Department of Education and Sports Sciences, Pegaso Telematic University, Naples, 80143, Italy.

Moscatelli, Fiorenzo: fiorenzo.moscatelli@unipegaso.it; <https://orcid.org/0000-0003-1274-0332>; Department of Education and Sports Sciences, Pegaso Telematic University, Naples, 80143, Italy.

Bargiacchi, Giuditta: giuditta.bargiacchi@studenti.unicampania.it; <https://orcid.org/0009-0003-0624-3038>; Department of Mental and Physical Health and Preventive Medicine, University of Campania “Luigi Vanvitelli”, Naples, 80138, Italy.

Ruberto, Maria: maria.ruberto@unipegaso.it; <https://orcid.org/0009-0003-9583-9203>; Department of Education and Sports Sciences, Pegaso Telematic University, Naples, 80143, Italy.

Cite this article as: Costanza, C., Colecchia, F. P., Polito, R., Monda, M., Carotenuto, M., Messina, G., Monda, A., Mancini, N., Moscatelli, F., Bargiacchi, G., & Ruberto, M. (2025) Martial Arts and ADHD: A Narrative Review of Cognitive, Behavioral, and Epigenetic Effects. *Physical Education Theory and Methodology*, 25(3), 684-690.
<https://doi.org/10.17309/tmfv.2025.3.26>

Received: 08.04.2025. Accepted 16.05.2025. Published: 30.05.2025

This work is licensed under a Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0>)