



Why there is a need for teaching adolescents with neurodiversity disorders MMA

Introduction

We believe at Combat Hub that mixed martial arts (MMA) can act as a form of education and therapy for adolescents with neurodiversity disorders.

Our goal is to provide MMA training to adolescents with neurodiversity disorders with the objective of improving physical fitness and coordination, providing opportunities for social interaction to foster communication skills, boost self-confidence, improve attention spans, and empower them to protect themselves. All this in an inclusive environment to reduce social isolation and create a sense of community.

We, as a newly opened gym, need donations to reach the next step of our journey on helping children with neurodiversity disorders increase their quality of life. We are confident that if we receive the right amount of funds, we will accomplish our goals. This document will show you why we are confident in our strategy and the reasoning behind the amount we are insisting for.

This document will cover:

- How exercise affects adolescents with attention deficit hyperactivity disorder (ADHD)
- How exercise affects adolescents with Autism Spectrum Disorder (ASD)
- How Mixed Martial Arts is a good form of exercise to teach adolescence with neurodiversity.
- The benefits of exergaming
- What the funding will be used for

How exercise affects adolescents with attention deficit hyperactivity disorder (ADHD)

Studies suggest that a single bout of aerobic exercise may enhance attention and inhibit responses in adolescents with ADHD (Metcalf et al., 2016). Physical activity programs positively influence behaviours and cognitive function such as attention in children with ADHD (Verret et al., 2012). Physical exercise can significantly help to alleviate the symptoms of ADHD and improve executive functions in children and adolescents with ADHD. Most of all, to promote adherence to treatment, they should be encouraged to perform the physical exercises that they enjoy most (Zhu et al., 2023).

How exercise affects adolescents with Autism Spectrum Disorder (ASD)

Studies suggest that structured physical activity interventions that target specific motor skills improve motor function in children with ASD and exergaming could be effective for improving executive functions (Rafiei Milajerdi et al., 2021). Further research indicates that physical exercise may be effective in reducing stereotypic behaviours in children with ASD (Ferreira et al., 2019). Exercise-based interventions reported positive and promising effects in two of the three core symptom domains: motor and social deficits (Sowa and Meulenbroek, 2012).



How Mixed Martial Arts is a good form of exercise to teach adolescents with neurodiversity.

Studies show that participation in martial arts interventions result in substantial improvements in behavioural and social functions. Individuals with ASD experienced decreased social dysfunction (Movahedi et al., 2013) and stereotypic behaviour (Bahrami et al., 2012). They had improved self-control (Chan et al., 2013), and were less impulsive in problem solving (Chan et al., 2013). Interventions that incorporated mind-body techniques led to increased calmness, communication, tolerance of discomfort, and decreased behavioural problems (Milligan et al., 2013). Some improvements were maintained for one month following the interventions, without continued practice (Bahrami et al., 2012; Movahedi et al., 2013).

Adolescents involved in the martial arts programs reported their goals for being involved were development of skill, mastery in martial arts, and improving their emotional well-being and peer relations (Milligan et al., 2013). Parents reported that martial arts intervention enhanced their child's willingness and persistence to persevere through difficulties (Milligan et al., 2013). Additionally, Scott and colleagues (2005) indicated that parents reported improvements in athletic and social performances in their children. Children increased openness to mainstream activities that had previously been avoided and expressed willingness to grow social circles. Parents benefited from the martial arts interventions themselves, as it allowed for social interaction with other parents during martial arts events, which served as a support network for them (Scott et al., 2005).

The Benefits of Exergaming

Studies show that physical exercise significantly alleviates symptoms of ADHD and improves executive functions in adolescents with ADHD, but results are shown to improve when participants perform exercise that they enjoy.

Exergaming, which involves the combination of exercise and video gaming, has been explored as an intervention for individuals with neurodiversity, including conditions such as ASD and ADHD. The following studies investigate the effects of exergaming on individuals with neurodiversity disorders. This pilot study investigated the potential benefits of exergaming for children with ASD. The results suggested improvements in executive function and social cognition after a six-week exergaming intervention. Participants with ASD significantly improved in inhibition and tests of working memory following a 20-minute bout of a dance-based exergame in comparison to a sedentary control condition (Anderson-Hanley, Tureck, and Schneiderman, 2011). Another study examined the effects of exergaming on children with ADHD. The findings showed improvements in executive functions and motor skills in the participants (Ji et al., 2023).

Most children and adolescents in Europe play video games (Müller et al., 2015) Therefore, our objective is to find methods of how to positively impact what type of digital games they use, and for what purpose they are playing. Considering this, exergaming is a viable tool to positively influence the screen time experience of adolescents (Benzing and Schmidt, 2018).

What the funding will be used for:

Specialized Equipment and Resources: Gyms catering to individuals with neurodiversity disorders may require specialised equipment and resources to accommodate the unique needs and challenges of their participants. Donations can help acquire or adapt equipment, such as sensory-friendly mats,



specialised exercise tools, safety gear tailored for neurodiverse individuals and exergaming equipment to keep participants engaged.

Qualified Staff and Instructors: Hiring qualified staff and instructors with expertise in both fitness training and neurodiversity is crucial for creating a safe and effective learning environment. Donations can be used to attract and retain skilled professionals who understand the specific requirements of working with adolescents with neurodiversity disorders. We aim to include participants, on the neurodiverse spectrum, in group classes but they may need 1-1 attention for optimal learning. Scott and colleagues (2005) recommended a maximum of 15 students per class with a 1:1 instructional ratio for children and adolescents with ASD using trained helpers.

Inclusive Programs and Adaptations: Donated funds can be used to develop and implement inclusive programs that cater to a diverse range of neurodiverse conditions. This may involve creating individualised workout plans, adapting exercises to accommodate different abilities, and providing additional support staff.

Community Outreach and Awareness: Donations can support outreach efforts to raise awareness about the gym and its programs. Increased visibility can help attract more participants, volunteers, and community support, fostering a sense of belonging and reducing social isolation for adolescents with neurodiversity disorders.

Free Programs: Some families with neurodiverse adolescents may face financial constraints. Donated funds can be used to subsidize or offer free programs, ensuring that cost is not a barrier to participation. This approach promotes inclusivity and allows a broader range of individuals to benefit from the gym's services.

Research and Program Improvement: Continuous research and evaluation of program effectiveness are essential for refining and enhancing gym programs for neurodiverse adolescents. Donations can support research initiatives, program evaluations, and ongoing improvements based on feedback and evolving best practices.

Community Building Activities: Beyond fitness training, gyms can organize community-building activities, outings, and events to promote social interaction and camaraderie among participants. Donated funds can help facilitate these activities, fostering a supportive community for both adolescents and their families.



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