MARTIAL ARTS AS AN INNOVATIVE THERAPEUTIC MODALITY FOR CHILDREN WITH AUTISM SPECTRUM DISORDER

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INTRODUCTION

Autism Spectrum Disorder (ASD):

- Neurodevelopmental condition with social communication challenges, restricted interests, and repetitive behaviors.
- Prevalence: 1 in 36 children diagnosed in the U.S
- Common co-occurrences: Intellectual disabilities, anxiety, motor coordination deficits

Traditional Interventions:

- Applied Behavior Analysis (ABA) is widely used but focuses on limited aspects of ASD

Martial Arts as Therapy:

- Structured yet adaptable, improving motor skills, neurological development, and psychosocial outcomes
- Disciplines like Tai Chi Chuan, Qigong, and Escrima show promise in addressing ASD-related challenges

PROBLEM STATEMENT

Children with Autism Spectrum Disorder (ASD) often face significant challenges in motor skills, neurological development, and social interaction. While effective in some areas, traditional therapeutic approaches may not fully address these individuals' diverse needs, necessitating alternative, holistic interventions.

OBJECTIVES

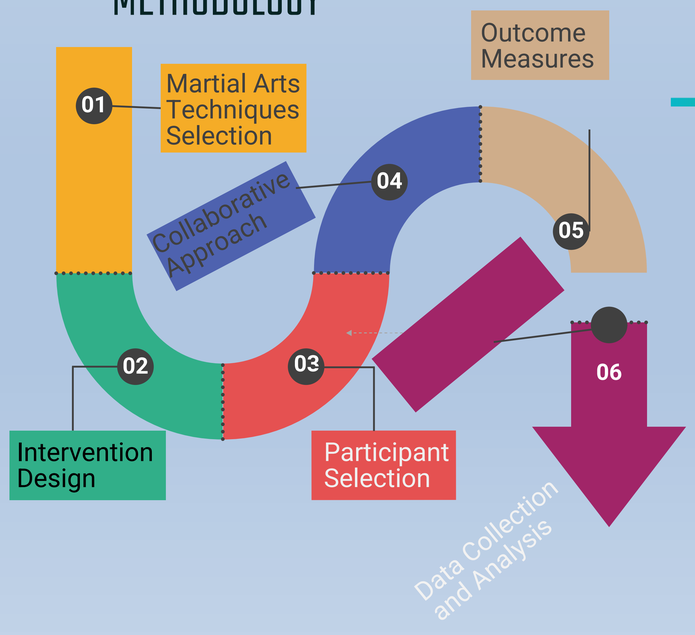
Main Goal:

01 To evaluate the effectiveness of martial arts-based interventions, specifically Tai Chi Chuan, Qigong, and Escrima

Specific Aim:

02 To improve motor coordination, neurological development, and psychosocial well-being in children with ASD

METHODOLOGY



MARTIAL ARTS TECHNIQUES

Tai Chi Chuan

- Slow, controlled movements.
- Effects: Improves balance, motor coordination, and focus

Qigong

- Meditative breathing and movement exercises.
- Effects: Reduces autism severity, enhances self-control, and improves sociability

Escrima (Filipino Stick Fighting)

- Bilateral rhythmic striking patterns using rattan sticks.
- Effects: Enhances proprioception, fine motor skills, and interlimb coordination

Brazilian Jiu-Jitsu (BJJ) & Judo

- Grappling-based arts with partner drills.
- Effects: Improves gross motor skills, body awareness, and social interaction

Jeet Kune Do (JKD)

- Versatile martial art incorporating techniques from various disciplines.
- Effects: Enhances motor adaptability, emotional regulation, and cognitive flexibility

INTERDISCIPLINARY APPROACH

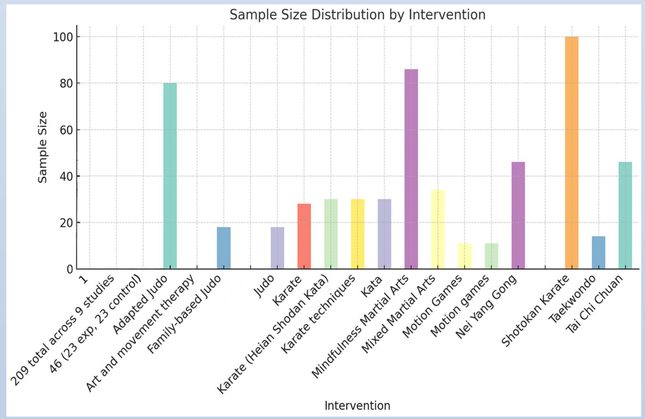
- **Collaboration with health professionals and parents to tailor interventions.**
- **Curriculum designed to meet sensory and communicative needs of children with ASD**

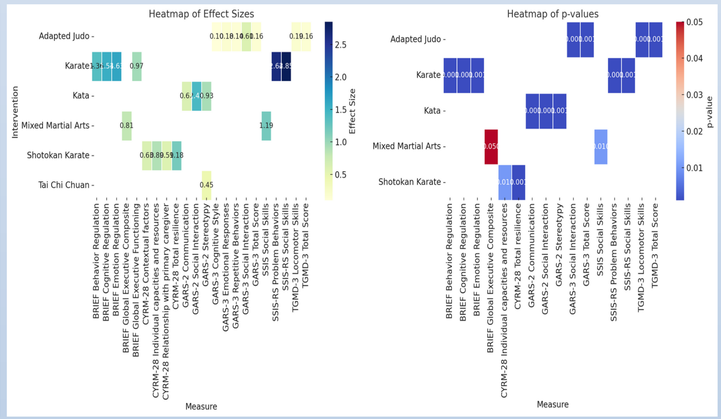
- **Physical Outcomes: Muscle tone, coordination, and endurance.**
- **Neurological Outcomes: Neuroplasticity and motor skill development.**
- **Psychosocial Outcomes: Social cohesion, anxiety reduction, and improved emotional regulation**

RELATED RESEARCH

Study/Authors	Intervention	Key Findings	Physical Impact	Psychosocial Impact
Bahrami et al. (2012)	Kata techniques for children with ASD	42.54% reduction in stereotypic behaviors	Improved motor coordination	Enhanced social interaction
Greco & De Ronzi (2020)	Karate program for children with ASD	Better communication and behavior	Enhanced physical fitness	Increased social skills, reduced repetitive behaviors
Haydicky et al. (2012)	Mindfulness Martial Arts (MMA) for adolescents	Improved self-regulation, decreased anxiety	Improved overall well-being	Reduced externalizing behaviors, better attention
Milligan et al. (2015)	MMA for youth with self-regulation challenges	Increased calmness, improved distress tolerance	Improved fitness and motor skills	Better peer relationships, reduced behavioral issues
Chen et al. (2024)	Sports game intervention for children with ASD	Enhanced executive function	Increased physical engagement	Improved cognitive flexibility, social behavior
Moore et al. (2020)	Martial arts interventions for mental health	Reduced internalizing mental health issues	Minor improvements in well-being	Reduced anxiety and depression
Phung et al. (2012)	MMA for children with ASD	Improved inhibitory control, cognitive flexibility	Enhanced motor skills	Improved emotional regulation, reduced stress

RESULTS





DISCUSSION

- **Sample Sizes:**
  - Larger interventions, like Karate, had more participants, leading to stronger statistical significance.
- **Effect Sizes & P-values:**
  - Karate showed the largest effect sizes across multiple measures, with consistently low p-values, making it the most impactful intervention.
  - Other interventions with high effect sizes (e.g., Kata) also showed significant results.
- **Heatmap Insights:**
  - Darker shades in effect size and p-value heatmaps confirm Karate and Kata as the most effective interventions.
- **Sum-up:** Karate had the strongest impact, with significant, reliable results across key measures.

CONCLUSION

- **Physical Improvements:** Enhanced motor coordination, balance, and muscle tone through structured martial arts training.
- **Neurological Benefits:** Increased neuroplasticity and cognitive flexibility, particularly from Tai Chi and MMA.
- **Psychosocial Gains:** Improved social interaction, reduced anxiety, and better emotional regulation.
- **Interdisciplinary Approach:** Tailored interventions addressing sensory and communication needs in children with ASD.
- **Future Research:** Larger studies are needed to confirm long-term benefits and standardize protocols.

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