

# EFFICACY OF MOTOR INTERVENTIONS TO IMPROVE MOTOR SKILLS IN CHILDREN WITH AUTISM SPECTRUM DISORDER: A SYSTEMATIC REVIEW



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## INTRODUCTION

- 80-90% of children with autism spectrum disorder (ASD) demonstrate difficulty performing age-appropriate motor skills.
- Motor intervention may improve the motor skills of children with ASD and specific motor learning strategies may result in improved outcome.

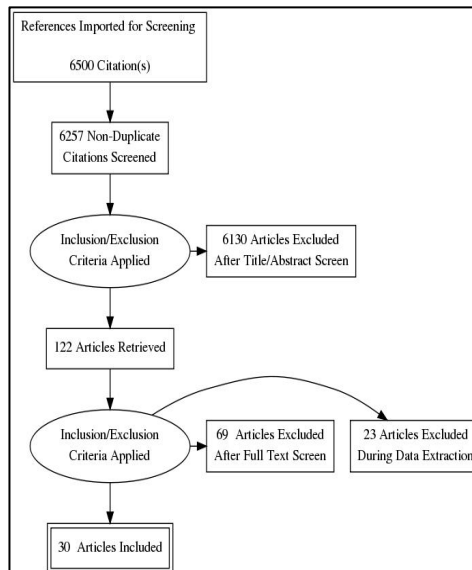
## OBJECTIVES

- Evaluate the efficacy of motor interventions to improve motor skills of children with ASD.
- Evaluate the efficacy of motor learning strategies to improve motor skills of children with ASD.

## METHODS

- **Search of 6 databases from 2000-2017**
  - Cinahl
  - Clinical Trials
  - Cochrane
  - PEDro
  - PubMed
  - Web of Knowledge
- **Inclusion Criteria**
  - Population: Children with ASD
  - Intervention: Motor intervention
  - Outcomes: Motor outcomes
  - Study Type: Group studies
- **Risk of Bias / Strength of Research**
  - Evaluative Method of Determining Evidence-Based Practices in Autism (Reichow, *J Autism Dev Disord*, 2008).

## PRISMA



- Included Studies (n=30)**
- 8 randomized control trials
  - 13 non-randomized clinical trials
  - 8 prospective cohort studies
  - 1 retrospective cohort study

## RESULTS

### Motor Intervention Improves the Specific Motor Skills Practiced

#### Participants

- 859 participants in 30 studies, ages 3-21 years

#### Motor Interventions (n = 1 study unless noted)

- Aquatic 6 ↑ swim skills, fitness, BOT-2, activity engagement
- Horse Riding Interventions 5 ↑ postural control, BOT-2, VABS-2 (motor), PedsQL
- Motor Skill Interventions 4 ↑ TGMD-2, BOT-2, PDMS-2, VABS-2 (motor)
- Physical Activity/Education 4 ↑ TGMD-2, ICAN motor skills, PedsQL, CHQ
- Exergaming 4 ↑ task speed, balance, fitness, BOT-2
- Traditional Greek Dance ↑ KTK (test of neuromuscular coordination)
- Soccer ↑ soccer skills (kicking accuracy, agility run)
- Table Tennis ↑ BOT-2
- Trampoline ↑ BOT-2
- Imitation Games (person v. robot) ↑ BOT-2
- Balance Training ↑ balance skills
- Stationary Bike, Balance, Ball Skills ↑ ball handling and balance skills

#### Most Frequently Reported Motor Learning Strategies

- ASD Specific 19 predictable routine, social relatedness, visual/pictorial support
- Task Modification 17 grading tasks, scaffolding, having novice and advanced options
- Observational Learning 12 modeling, demonstrations

#### Strength of Research

- Strong 1 effects of attentional focus on motor learning of a throwing task
- Adequate 5 hippotherapy, simulated horse, table tennis, motor activity program, imitation games
- Weak 24

Note: BOT-2, PDMS-2, TGMD-2, and VABS-2 are tests of motor development/skills; PedsQL and CHQ are quality of life measures.

## CONCLUSION

This review found limited evidence for the efficacy of motor intervention to improve motor skills of children with ASD. Further high quality research is needed to support the use of motor intervention to improve motor function in this population.

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