Do Movement-Based Sensory Interventions Increase Education Participation in the Classroom for Students with ASD?

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Objectives

At the conclusion of this presentation, participants will be able to…

- **Identify** the impact of sensory processing problems on education participation
- **Contrast** the various movement-based sensory interventions
- **Compare** which movement-based sensory interventions positively impact education participation for students with ASD

Introduction

Autism Spectrum Disorder (ASD)

- Is a developmental disability that may result in significant communication, behavioral, and social challenges (Centers for Disease Control and Prevention [CDC], 2020).
- Around 1 in 54 children have been identified as having ASD (CDC, 2020).

Sensory-Related Problems

- About 80% of children with ASD exhibit sensory-related problems (Case-Smith et al., 2014).
- **Sensory challenges may impact a child's engagement and participation both in formal and informal education activities** (Sadr et al., 2017).
- The appropriate programming and interventions can support participation and performance in daily routines and activities (Sadr et al., 2017).

Occupational Therapy Practitioners:

- **May contribute to a student's education team** (American Occupational Therapy Association, 2016).
- Address the client's impacted occupational performance and participation by using sensory-based interventions (Schaaf et al., 2015).

Purpose

This systematic review assesses the current movement-based interventions utilized for students with ASD. The purpose of this systematic review is to examine whether sensory-based interventions that target movement can impact a child with ASD's education participation.

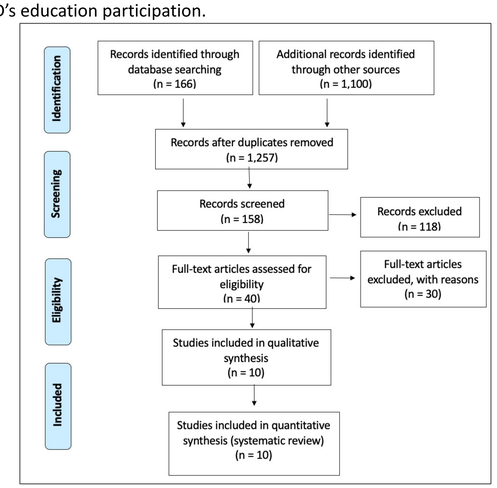

Figure 1. PRISMA Flow Diagram. This figure shows the phases of the systematic review (Moher et al., 2009).

Methods

An extensive search using the following databases was conducted:

- CINAHL, Google Scholar, PsycINFO, SPORTDiscus, and ERIC

Key search terms used included:

- "Movement-based sensory interventions"
- "Autism Spectrum Disorder"
- "Students"
- "Education participation"

To assess the quality of evidence, the following were used:

- The Quality Assessment Tool for Before-After (Pre-Post) Studies With No Control Group
- The Quality Assessment Tool for Case Series Studies

Table 1

Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
• Movement or vestibular interventions	• Outcomes only focused on perspectives of sensory-based movement interventions
• School-aged children with ASD	• Articles not translated to English
• Outcomes focused on education participation	• Articles solely looking at impacts on stereotyped behavior
	• Systematic Reviews

Results

Table 2

Article Descriptions

Study	Intervention	Age Range Years	Number of Participants	Reported Barriers to Education Participation	Sensory Assessment Used	Frequency	Behavior Measured	Outcome	Implementation of Intervention	Interventionist
Nakutin & Gutierrez, 2019	Physical activity (jogging)	6-7	3	- Low academic engagement	None	2 times/ week for 2 weeks	- Academic engagement - Executive functioning	Clinically significant - Academic engagement increase	Antecedent intervention	Researcher
Benson et al., 2020	Physical activity (walking, marching) Sensorimotor strategies (standing, clapping)	4-5	3	Not mentioned	None	2 times/ week for 4 weeks	- In-seat behavior - Attention	**Statistically significant** - In seat behavior increase - Attention increase - participant 1 in seat p= 0.004 - participant 2 in seat p< 0.006 - participant 2 attention p< 0.002	Integrated into a routine	Researcher
Miramontez & Schwartz, 2016	Physical activity/movement (dancing, yoga)	5-6	3	Not mentioned	None	1 time/ day for 2 weeks	- On-task behavior	Clinically significant - On task behavior increase	Integrated into a routine	Teacher
Pokosorki et al., 2019	Gross motor activities and sensory interventions (scooter board, trampoline)	4.5	1	- High levels of vocal and motor stereotypy - Low levels of engagement - Difficulty responding to social interactions	Sensory Profile 2	2-3 times/ day for 3-4 days/ week for 6 weeks	- Engagement - Stereotypy	Clinically significant - Engagement increased with gross motor and SBI interventions	Antecedent intervention	Teacher and Researcher/ Occupational Therapist
Mancil et al., 2016	Platform swing Sensorimotor strategies (spinning, bouncing)	8-10	3	- Difficulty with academic tasks - Difficulty completing assignments	None	2 times/ week for 7.5 weeks	- On-task behavior - Off-task behavior - Abberant behavior	Clinically significant - Academic improvement with linear swing and sit and spin	Antecedent intervention	Researcher
Murdock et al., 2014	Platform swing	2-6	30	Not mentioned	Sensory Profile	1 time	- Out-of-seat behavior - On-task behavior - Engagement - Non-stereotyped or repetitive behavior	No significance	Antecedent intervention	Researcher/ Occupational Therapist
Sadr et al., 2017	Alternative seating (air cushions, therapy balls)	6-9	15	- Difficulty with in-seat behavior - Difficulty staying on-task	None	Every day for two weeks	- In-Seat Behavior - On-task behavior	**Statistically significant** - In seat behavior increase with therapy balls p < 0.001	Integrated into a routine	Researcher
Mills et al., 2016	Sensory activity schedule	5-7	4	- Movement-seeking behaviors	Short Sensory Profile	No specific frequency mentioned	- Education participation - On-task behavior	**Statistically significant** - Improvement in participation - participant 1 p=0.038 - participant 2 p=0.004 - participant 3 p=0.002	Antecedent intervention	Teacher

Discussion

The movement-based interventions that indicated an impact on education participation include sensorimotor strategies, physical activity, sensory activity schedule, and therapy balls as alternative seating (Benson et al., 2020, Mills et al., 2016, Sadr et al., 2017)

Themes:

- Implementation of the intervention - incorporation into classroom routine or antecedent strategies.
  - **Incorporating the intervention into the classroom routine resulted in more statistically significant and positive impacts** (Benson et al., 2020, Sadr et al., 2017)
- Interventionist – teacher, researcher, or researcher/occupational therapist
  - **Two out of three studies implemented by researchers resulted in statistically significant and positive impacts** (Benson et al., 2020; Sadr et al., 2017)

Clinical Implications

The results demonstrated a need for clinicians to:

- Assess individual sensory processing patterns
- **Use individualized interventions to address sensory-processing needs**
- Educate future clinicians and rehabilitation departments on appropriate sensory interventions for specific sensory processing needs

Future Research

Future research should focus on:

- How sensory interventions should be implemented (antecedent vs. incorporated)
- What type of interventionist and training level provide the most effective results

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