

Evidence Topic: Dynamic Seating

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Evidence Question:

Does dynamic seating improve time on task in children with attention deficit hyperactivity disorder, a sensory processing disorder, or autism spectrum disorder?

Question Background:

One strategy that occupational therapists employ to address time on task and increase attention settings is dynamic seating. Dynamic seating refers to any movement that occurs during sitting and can include equipment that ranges from Disc 'O' Sits to therapy balls. Occupational therapy literature suggests that dynamic seating systems in the classroom may improve a child's sensory modulation and attention to task which results in an increase in performance (Pheiffer, Henry, Miller, & Witherell, 2008). The increase in attention and focus on task occurs because the child is able to engage their proprioceptive and vestibular systems while using dynamic seating,

Parameters of the Search:

Parameters

Studies with the focus of dynamic seating improving time on task in children with attention deficit hyperactivity disorder or a sensory processing disorder were evaluated. Research that addressed dynamic seating within the pediatric population and children with attention deficit hyperactivity disorder or a sensory processing disorder were considered. Studies were excluded if they pertained to impairments other than the two previously mentioned impairments or if the publishing date exceeded ten years.

Keywords

Dynamic seating, adaptive seating, sensory processing impairment, attention deficit hyperactivity disorder, strategies, autism, occupational therapy, postural alignment, school, classroom seating, children, early childhood, participation, attention, pediatrics, school, effectiveness, therapy balls, sensory strategies, school based interventions, behavior, task

Websites and Resources

Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, Education Resources Information Center (ERIC), American Journal of Occupational Therapy (http://www.aota.org/Pubs/AJOT_1.aspx), American Occupational Therapy

Evidence Table

Citation	Type of Evidence & Access	Description of Evidence/ Type of study	Level of Evidence	Description of Population	Description of Intervention	Outcome/ Findings
Pfeiffer, B., Henry, A., Miller, S., & Witherell, S. (2008, May/June). Effectiveness of Disc 'O' Sit cushions on attention to task in second-grade students with attention difficulties. <i>American Journal of Occupational Therapy</i> , 62(3), 274-281.	Randomized control trial	A pretest-posttest experimental design that evaluated the effectiveness of dynamic seating within a treatment and control group.	2	The population was drawn from six elementary schools in northeastern Pennsylvania. The sample consisted of 61 second grade students. Inclusion criteria included parental and student consent and students must present with attention difficulties within the academic setting. Exclusion criteria included no parental consent, if students did not like the cushions, or if the student had inner ear difficulties. Attention difficulties were determined by scoring a 15 or more on the Behavioral Rating Inventory of Executive Function (BRIEF) filled out by the student's teacher.	By using a random numbers chart, each student was randomly assigned to the control or treatment group. Prior to the study, each participant was able to sit for a 1-hr period in a Disc 'O' Sit and the participants' teachers completed the BRIEF pretest based on student's current attention skills. Members of the treatment group were provided a Disc 'O' Sit cushion for their regular classroom chair for 2 hours a day for 2 weeks. Members of the control group sat in their regular classroom chairs without cushions for the same length of time. The participants' teachers filled out the posttest BRIEF based on the student's attention skills with the Disc 'O' Sit.	The findings suggest that the Disc 'O' Sit cushion does increase attention to task within a population of second grade students. Significant differences were found in the change between the treatment and control group. Using a one way ANOVA to calculate the percentage of change in the treatment and control groups the following differences were found. Significant differences on the subsections of the BRIEF suggest that the Disc 'O' Sit cushion may improve attention. Significant differences were also found by the lower scores in the metacognition index of the BRIEF. This indicates that the Disc 'O' Sit cushion may improve self-management of tasks and monitoring of performance.

<p>Schilling, D., & Schwartz, I. (2004, August). Alternative seating for young children with autism spectrum disorder: Effects on classroom behavior. <i>Journal of Autism and Developmental Disorders</i>, 34(4), 423-433.</p>	<p>Quasi-experimental study</p>	<p>Single subject withdrawal design. The intervention was designed in an A-B-A-B format for 3 participants and B-A-B for 1.</p>	<p>3</p>	<p>The population was drawn from a public-school funded preschool program located on a University campus. The sample consisted of 4 preschool age males with a diagnosis of Autism Spectrum Disorder.</p>	<p>Intervention occurred in the classroom setting and was individualized for each participant. For each child their teacher selected the activity period in which the intervention occurred. The selected times included art, play activities, small group, and circle time. Each participant was fitted for a therapy ball and for a 2 week period during the selected activity time the intervention was implemented. The intervention time was determined by the activity length. Thus, the time of intervention varied for all the participants.</p>	<p>The findings suggest that therapy balls did increase in-seat behavior and engagement of tasks and activities within all 4 participants. Inter-observer agreement for in-seat behavior ranged from 95% to 100% and engagement ranged from 82% to 100% which indicates significance in the use of the therapy ball. Social validity findings also reveal that the classroom staff and teachers strongly supported the use of balls within the classroom setting.</p>
<p>Schilling, D., Washington, K., Billingsley, F., & Deitz, J. (2003, September/October). Classroom seating for children with attention deficit hyperactivity disorder: Therapy balls versus chairs. <i>American Journal of Occupational Therapy</i>, 57(5), 534-541.</p>	<p>Quasi-experimental study</p>	<p>Single subject withdrawal design using a A-B-A-B interrupted time series design.</p>	<p>3</p>	<p>The population was drawn from a public school in the state of Washington. The sample consisted of 3 fourth grade children with a diagnosis of ADHD. All other 24 students in the classroom used the intervention of therapy balls. Two participants had concomitant diagnosis of oppositional defiant disorder and severe behavior disorder.</p>	<p>Intervention began after parental consent and participant assent were given and all students had been fitted for a therapy ball. Intervention occurred during the middle 40 minutes of a 60 minute language arts session for duration of 4 phases that lasted a total of 12 weeks. During the intervention, 2 pediatric therapists rated and observed the participants behavior and word productivity.</p>	<p>The findings suggest that sitting behavior and word productivity increased when using therapy balls within the classroom setting for 4th grade students. Social validity findings suggest that students and teachers opted for therapy balls over traditional classroom seating for comfort, writing, and productivity.</p>

EBPX Summary

The research studies indicate that use of the Disc 'O' Sit cushions and therapy balls in the classroom setting may improve attention to tasks and behavior for children with impairments. The Disc 'O' Sit cushions has been shown to increase behavior and attention for children with attention deficits, however, more studies are needed to show evidence to suggest an increase for children with sensory impairments or autism. Prior to these studies little systematic research had been conducted on the effectiveness of dynamic seating in improving time to task. Although these studies do suggest that therapy balls and Disc 'O' Sit cushions and therapy balls have positive benefits for classroom students, additional studies of higher rigor are needed to validate overall the effectiveness of dynamic seating.

EBPX Strength and Impact Summary

There is SOME EVIDENCE to indicate that dynamic seating increases student attention and engagement to tasks. Therapists are justified in giving some consideration to use of this intervention.