Effectiveness of Disc 'O' Sit Cushions on Attention to Task in Second-Grade Students With Attention Difficulties

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KEY WORDS
- attention
- Disc 'O' Sit Cushion
- dynamic seating
- pediatrics
- school
- sensory integration

This study investigated the effectiveness of a type of dynamic seating system, the Disc 'O' Sit cushion (Gymnic, Osoppo, Italy), for improving attention to task among second-grade students with attention difficulties. Sixty-three second-grade students participated in the study. Using a randomized controlled trial design, 31 students were assigned to a treatment group, and 32 were assigned to a control group. Treatment group participants used Disc 'O' Sit cushions throughout the school day for a 2-week period. The teachers completed the Behavior Rating Inventory of Executive Functioning (Gioia, Isquith, Guy, & Kenworthy, 1996) for each participant before and after the intervention. An analysis of variance identified a statistically significant difference in the attention to task before and after the intervention for the treatment group. The results of the study provide preliminary evidence for the use of the Disc 'O' Sit cushion as an occupational therapy intervention to improve attention in the school setting.

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Wide public concern exists in the United States today about the state of education, including individual student academic performance. The No Child Left Behind Act of 2001 (Pub. L. 107–110), signed into law on January 8, 2002, affects virtually every public school in the United States (Hyun, 2003). At its core are several measures designed to hold states and schools more accountable for student academic performance and academic progress. States must bring students up to the "proficient level" on state tests by the 2013–2014 school year and make adequate yearly progress toward this goal.

Occupational therapy practitioners in the school setting are part of a collaborative team of professionals whose main focus is to improve a student's performance throughout activities and educational tasks while at school (Jackson, 2007; Schwartz, Finkelstein, & Orentlicher, 2003). Occupational therapists evaluate both the student and the student's classroom environment to determine what factors might be interfering with his or her attention to tasks and subsequent academic performance and achievement. Eggen and Kauchak (2004) defined *attention* as the process of consciously focusing on relevant stimuli while blocking out irrelevant stimuli. The ability to neurologically organize sensory stimuli to determine its relevance is a process of sensory integration. A theory of sensory integration was developed by A. Jean Ayres in the 1960s and continues to be refined today by occupational therapists and other professionals.

Sensory integration is defined as the neurological organization of sensory information from an individual's environment for adaptive motor or behavioral responses (Ayres, 1972). The brain regulates its own activities and decides whether to act on or ignore sensory information. This process of facilitation or inhibition, known as *sensory modulation,* has a direct effect on a person's attention and behavior. Recent

research has determined that children with sensory-processing disorders demonstrate less sensory gating when processing sensory information than children without sensory-processing disorders (Davies & Gavin, 2007). Consequently, children with sensory-processing disorders are not able to suppress repeated or irrelevant sensory information. Another way to describe modulation is the student's ability to generate responses that are appropriately graded in relation to the sensory stimuli being taken in, neither underreacting nor overreacting (Lane, 2002). When a person has difficulty modulating sensory information within his or her environment, he or she may have trouble attending to relevant stimuli for adaptive behaviors such as learning.

Occupational therapists in the school setting are often guided by the sensory integrative frame of reference when a student's functional academic skills are adversely affected by his or her inability to modulate sensory input within the classroom (Case-Smith, 1997). The occupational therapist analyzes the child's processing of various types of sensory input, including tactile (touch), proprioceptive (deep pressure), and vestibular (movement) in relation to his or her ability to learn and examines what specific intervention would enable the student to attend to and participate more fully in classroom tasks (Nackley, 2001). A recent study identified the effective use of sensory integrative occupational therapy interventions in improving attention in children with sensory modulation disorder (Miller, Coll, & Schoen, 2007). When compared with control groups, the children who participated in the sensory integrative interventions made significant improvements on an attentional measure.

Therapists may implement an individualized "sensory diet" to address the student's sensory needs throughout the school day. A *sensory diet* is a schedule of activities that provide a student with vestibular, proprioceptive, and tactile input throughout daily routines. According to Wilbarger (1984), the sensory diet is based on the principle that enhanced sensation through self-selected, self-initiated activities can have profound effects on a child's adaptive functioning. The sensory diet varies according to each child's preferences, goals, and limitations.

Children with decreased discrimination of proprioceptive and vestibular input often exhibit poor balance, poor posture, constant moving and fidgeting, and poor attention (Nackley, 2001). As part of the student's sensory diet, occupational therapy intervention would focus on providing the student with activities that provide proprioceptive and vestibular input to improve balance, posture, and attention. Activities that provide proprioceptive and vestibular input to improve attention have been identified as interventions currently used in the school-based setting.

In a study by Mulligan (2001), teachers were surveyed to identify which classroom strategies were implemented and perceived as effective in helping to improve attention in children with attentional issues in the school setting. Movement breaks were identified as one of the more effective strategies by classroom teachers. Providing movement while sitting may provide consistent input without the frequent need to get out of one's seat. Occupational therapy literature suggests that using dynamic seating systems in the classroom is one strategy to improve a student's sensory modulation and attention (Kimball, 1999).

In her article on dynamic seating, Lange (2000) defined the term *dynamic* as implying movement; hence, *dynamic seating* refers to movement while sitting. She stated that sitting in one position for long periods of time can lead to decreased stimulation. Because the body experiences less proprioceptive and kinesthetic feedback when it does not move, there may be decreased attention related to a state of underarousal. It is hypothesized that the Disc 'O' Sit cushion (Gymnic, Osoppo, Italy) uses the principles of engaging the proprioceptive and vestibular systems to keep alert and focused on task to address poor attention. Studies have identified that children with attention deficit/hyperactivity disorder (ADHD) tend to have a greater amount of movement than their peers when seated and that they tend to demonstrate autonomic underarousal. Crowell et al. (2006) found that preschool children identified to be at risk for ADHD had autonomic underarousal compared with nonrisk peers as determined by the physiological measures of electrodermal and cardiac responses. Teicher, Ito, Glod, and Barber (1996) noted that boys with ADHD have a significantly greater amount of movement when seated than that of their peers. It has been theorized that this movement is an attempt to provide themselves with additional vestibular and proprioceptive input to maintain an optimal state of arousal necessary to attend to relevant stimuli. The proprioceptive and vestibular (movement) input provided through dynamic seating may help to increase the arousal states necessary to attend to relevant tasks.

Using a single-subject design, Schilling, Washington, Billingsley, and Dietz (2003) studied the effectiveness of therapy balls as a dynamic seated intervention to improve attention in children with ADHD in the school setting. They reported an increase in in-seat behavior along with improvements in legible word production for the students identified with attentional issues. A similar study (Schilling & Swartz, 2004) investigated the effects of using therapy balls for seating on the engagement of young children with autism spectrum disorders. Results of the study suggested substantial improvements in students' engagement when seated on therapy balls, as documented by observational

data. In both studies, social validity findings indicated that teachers preferred the therapy balls for student seating.

In Switzerland, 5,000 classrooms are using therapy balls as the primary seating for school students. This program, known as "Moving Students Are Better Learners," is based on the philosophy that those students sitting on therapy balls are better able to focus on class activities (Illi, 1994).

Most current literature describes the use of therapy balls as the dynamic seating system of choice to use in the classroom to improve the student's attention and engagement in tasks. The authors found only one article that referred to the use of Disc 'O' Sit cushions as a strategy to use in the classroom to help children modulate their attention through self-imposed movement. The Disc 'O' Sit cushion is a round, air-filled cushion that comes in two sizes (small and large) and is widely available. It is designed to fit on a classroom chair and provide movement while seated. Therefore, it is not necessary to replace the chair with a larger and more distracting piece of equipment, such as a therapy ball. Although the Disc 'O' Sit cushion is an intervention currently used in school-based settings, limited research supports the effectiveness of its use. No literature was found specifying the use of the Disc 'O' Sit cushion in the regular education classroom for improving a student's attention to task.

The purpose of this study was to determine the effectiveness of a sensory-based intervention, a dynamic seating system, for improving a students' attention to task within the classroom setting. Specifically, this study addressed the following research question: *Are Disc 'O' Sit cushions effective for improving the attention of second-grade students with attentional difficulties within the classroom?*

Method

Design

This study used a pretest–posttest experimental design with random assignment to a control or a treatment group to determine the effectiveness of a dynamic seating system, the Disc 'O' Sit cushion, on improving attention to task. An estimated power analysis completed before data collection determined that approximately 33 participants would be needed for each group based on an alpha level of .05 (two-tailed), power at 66%, and a medium effect size of .60 (Cohen, 1988). A medium effect size was anticipated; it was expected that changes would be "visible to the naked eye" (Portney & Watkins, 2000, p. 706) because observation was a primary component in completing the measurement tool. The "power of a study is the probability that it will yield statistically significant results" (Cohen, 1988, p. 1). Because of the low response in returning the parental consent forms for the study, the sample size was slightly smaller than anticipated and therefore initially considered underpowered. In the final data analysis, 29 participants were in the treatment group and 32 were in the control group. A postintervention power analysis actually identified high levels of observed power on the attentional measures of the global executive index (.999), behavioral rating index (.985), and the metacognition index (.874).

Participants

The participants in this study were selected from all the second-grade classrooms in six elementary schools within the Pocono Mountain School District in northeastern Pennsylvania (written permission granted). The sample consisted of the 63 students who received parental consent and provided child assent.

To be included in the study, students must have demonstrated attention difficulties in the academic setting. Attention difficulties were determined by having teachers systematically record observations of each child in his or her classroom on the basis of a list of behaviors associated with attentional issues. We developed the list of behaviors on the basis of an existing attention scale, the Behavioral Rating Inventory of Executive Function (BRIEF; Gioia et al., 1996). Students who scored 15 or more on the observational forms were identified as having significant attention difficulties. This inclusion score was determined from obtaining norms based on a small sample of children without attentional issues. A score of 15 was greater than 1 standard deviation from the mean of the normative sample (Ayres, 1991; Portney & Watkins, 2000). The teachers completed the observational forms on every child in their class, and 658 were returned. Some characteristics indicating poor attention to task include being easily distracted by noise, out of control (behavior that could not be controlled or changed with two to three verbal reminders or cues), and fidgetiness (inability to sit without extraneous movements). The questions on the observational form were answered on the basis of the student's performance during sedentary times of the day.

On consent forms sent home to obtain permission to participate in the study, parents were asked if their child had inner ear difficulties. Inner ear difficulties were exclusion criteria for the study because the inner ear contains the peripheral mechanisms for the vestibular system. Certain types of movement experiences can have a negative influence on the vestibular system and secondarily the nervous system if a child has inner ear difficulties (Golz et al., 1998). Students were excluded if they decided they did not like the cushion at the time of an equipment trial. No students were excluded

for either inner ear difficulties or their reactions at the time of the equipment trial.

After identifying the children who met the inclusion criteria and who received parental consent to participate, the students in regular education placements were randomly assigned to either the treatment group or the control group on the basis of a random numbers chart. Stratified random sampling was used to split students who received special education into the treatment and control groups to ensure that an equal number of students in each group received special education services. Selection and maturation effects were avoided by ensuring that the number of students in learning support and the number of students in regular education was equivalent in both the treatment group and the control group. If the percentage of special education students in the two groups was not equal, results could be affected on the basis of the educational abilities of the students and not on their use of the cushion.

Outcome Measures

The BRIEF was used as the pretest and posttest measure for participants in both the treatment group and the control group. This tool is a questionnaire designed to be administered by anyone familiar with students in the academic setting, although the BRIEF manual suggests that teachers or teacher's assistants complete the tool. As part of standard teacher in-service with the school psychologist in the Pocono Mountain School District, each teacher had received training in the administration of the BRIEF. The BRIEF is designed for students ages 5 to 18 and takes 10 to 15 min to complete. The BRIEF is used to determine a child's self-control and problem-solving skills, including behavioral regulation and metacognition, which are all aspects of attention. The tool was selected for this study because of its strong test–retest reliability (.88) and the establishment of construct validity with the measures of attention, impulsivity, and learning skills (Gioia et al., 1996).

The BRIEF consists of two indexes: the behavioral regulation index (BRI) and the metacognition index (MI). The global executive composite (GEC) is the combined score of both indexes. The BRI is made up of raw scores from Inhibit, Shift, and Emotional Control scales. The Inhibit scale measures the ability to control impulses and stop behavior. The Shift scale measures the ability to transition from one activity or situation to another, and the Emotional Control scale measures the ability to modulate emotional responses. The MI is made up of the scales Initiate, Working Memory, Planning and Organizing, and Monitoring. The Initiate scale measures the ability to begin an activity and generate ideas, whereas the Working Memory scale measures the ability to retain information for the purpose of completing a task. The Plan and Organize scale measures the ability to anticipate future events, set goals, and develop a plan. Finally, the Monitor scale measures the ability to check and assess one's own work and performance.

Procedures

Institutional review board approval was obtained through College Misericordia before the start of the study. Along with this approval, written approval was obtained from the Pocono Mountain School District. All students in the second-grade classes in the Pocono Mountain School District were screened using a 10-question behavioral observation form completed by their classroom teachers to determine whether they could be included in the study. Those students who scored 15 or more on the behavioral observation forms were identified as having potential attention difficulties. The students participating in the study had the opportunity to experiment with a Disc 'O' Sit cushion for a 1-hr period during the week before the beginning of the study to ensure that they felt comfortable on the cushion and understood how to sit on it and to rule out the novelty factor. The amount of air in the cushion was determined by the child's preference at the trial session.

For the study, each member of the treatment group was provided with a Disc 'O' Sit cushion to place on his or her regular classroom seat for 2 hr a day for a 2-week period. The members of the control group sat in regular classroom chairs without a cushion for the same length of time. The time blocks are standard in the second-grade classrooms throughout the school district. The time of the day for each participant differed from one second-grade classroom to another depending on the particular school schedule, although each student participated in similar school activities and subjects when sitting on the cushions and the time periods were consistent.

The student's teachers completed the BRIEF pretest scale on the Friday before the study period, basing their answers on the student's attention skills for the 2-week period just before the study began. After the 2-week trial of Disc 'O' Sit cushions for the treatment group and no treatment for the control group, the teachers then completed the BRIEF posttest scale.

Data Analysis

Data were analyzed using SPSS Version 13 (SPSS, Inc.; Chicago). Descriptive statistics were calculated to determine the mean age of participants, gender, school building, and the classroom (regular education, special education, or gifted) in the treatment and control groups.

To determine whether there was a significant difference between the treatment and control groups in attention after

the intervention, a one-way analysis of variance (ANOVA) was used to analyze the dependent variable of percentage of change for the independent variable of group (control or treatment). The percentage of change was calculated using a formula (posttest–pretest/pretest), and then a one-way ANOVA was completed. The analysis was completed to determine whether the percentage of change was significant on the BRI, MI, and GEC of the BRIEF (Gioia et al., 1996) when comparing the groups. The criterion for the level of statistical significance was defined at .05 for all results in the study.

Results

The sample included 61 participants after 2 students dropped out of the treatment group within the first week of the study. Of the 61 remaining participants, 29 were in the treatment group and 32 were in the control group. There were 45 boys (73.8%) and 16 girls (26.2%) in the study. The age of the participants ranged from 90 to 112 months with a mean age of 98.87 months. The participants were divided among six elementary schools. In the treatment group (n = 29 student participants), 23 boys and 6 girls represented five of the six elementary schools. Twenty-three of the students in the treatment group were in regular education, 5 were in learning support, and 1 was in gifted classes. The control group consisted of 32 student participants; 22 boys and 10 girls. The participants in the control group represented six of the six elementary schools. Of those 32 students in the control group, 26 were in regular education and 6 were in learning support classrooms.

To determine whether the groups were comparable on baseline measures before intervention, an independent sample t test was performed. There were no significant statistical differences in the pretest scores on the BRIEF between the control and treatment groups before the initiation of the study (t[59] = 1.447, p > .05). The mean of the control group was 62.94 (SD = 8.48), and the mean of the treatment group was 65.07 (SD = 8.26).

A one-way ANOVA was calculated to compare the percentage of change in the treatment and control groups on the GEC (Table 1). A significant difference was found in the percentage of change between the treatment and control group (F[1, 59] = 28.31, p < .05). The analysis revealed that the percentage of change in the pretest and posttest mean scores on the GEC for the treatment group decreased significantly when compared with the percentage of change in the pretest and posttest mean scores of the control group (Table 1). A small to medium effect of intervention on GEC scores was found (η^2 = .324).

A one-way ANOVA was calculated to compare the percentage of change in the treatment and control groups on the BRI (Table 1). A significant difference was found in the percentage of change between the treatment and control group (F[1, 59] = 17.52, p < .05). The analysis revealed that the percentage of change in the pretest and posttest mean scores on the BRI for the treatment group decreased significantly when compared with the percentage of change in the pretest and posttest mean scores of the control group (see Table 1). A small to medium effect of intervention of BRI scores was found (η^2= .229).

A one-way ANOVA was calculated to compare the percentage of change in the treatment and control groups on the MI (see Table 1). A significant difference was found in the percentage of change between the treatment and control group (F[1, 59] = 9.976, p < .05). The analysis revealed that the percentage of change in the pretest and posttest mean scores on the MI for the treatment group decreased significantly when compared with the percentage of change in the pretest and posttest mean scores of the control group (Table 1). A small effect of intervention on MI scores was found (η^2 = .145).

Discussion

Decreased attention to task has been identified as interfering with learning in the elementary school setting (Williams & Shellenberger, 1996). The purpose of this study was to determine the effectiveness of a sensory-based intervention, a dynamic seating system, on improving a student's attention to task within the classroom setting. The results of this study

Table 1. Means, Standard Deviations, and One-Way Analysis of Variance (ANOVA) for Effects of Disc 'O' Sit Cushion on Global Executive Composite (GEC), Behavioral Regulation Index (BRI), and Metacognition Index (MI)

	Treatment				Control				ANOVA	
	Pretest		Posttest		Pretest		Posttest			
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	F(1, 61)	η^2
GEC	156.24	22.87	135.41	31.91	147.59	23.69	146.34	25.98	28.31**	.324
BRI	55.76	12.20	47.59	13.68	51.75	11.11	51.47	11.17	17.53**	.229
MI	100.48	15.80	87.83	20.07	95.84	3.32	94.88	3.31	9.98*	.145

Note. η^2 = effect size.

*p < .01 (two-tailed). **p < .001.

indicated that using a Disc 'O' Sit cushion increased attention to task in second-grade students. Significantly lower scores on the subsections of the BRIEF suggest that attention to task may improve when using a Disc 'O' Sit cushion with children who have attentional issues in the second grade.

The BRI section of the BRIEF represents the child's ability to modulate emotions and behavior through appropriate inhibitory control and to shift cognitive set (Gioia et al., 1996). Significantly lower scores on the BRI subsection of the BRIEF indicate the use of the Disc 'O' Sit cushion improves the child's systematic problem solving and supports appropriate self-regulation. These results are consistent with the findings of two other studies measuring the modulation of behavior and emotion responses. Schilling et al. (2003) identified a significant change in in-seat behaviors in children identified with ADHD when using the dynamic seated intervention of a therapy ball. In a similar study, Schilling and Schwartz (2004) identified a significant increase in attention to engagement in children diagnosed with autistic spectrum disorders when seated on therapy balls.

The MI represents the child's ability to plan, organize, and initiate problem solving in working memory (Gioia et al., 1996). Significantly lower scores in the MI subsection of the BRIEF indicate that the use of the Disc 'O' Sit cushion improves the child's ability to cognitively self-manage tasks and to monitor his or her performance. This finding is supported by a previously published study (Schilling et al., 2003) that identified improvements in a specific skill requiring the ability to plan and organize a motor output while using working memory. The study identified a significant improvement in legible word production in children with attentional issues when therapy balls were used as a dynamic seated intervention.

The results of the current study are consistent with the literature reviewed and the study hypothesis that the Disc 'O' Sit cushions would be effective in improving the attention of second-grade students with attentional difficulties in the classroom setting. Dynamic seating interventions such as the Disc 'O' Sit cushion are hypothesized to provide proprioceptive and vestibular sensory input. It has been suggested that children with attentional issues require a greater amount of proprioceptive and vestibular input to maintain arousal states for attention to relevant stimuli (Crowell et al., 2006; Teicher et al., 1996). Although the results of the study were significant, the effect size of the intervention was only small to medium. It is possible that the Disc 'O' Sit cushion provides only minimal amounts of proprioceptive and vestibular input and that additional input through combining interventions may demonstrate a greater effect on attention.

In general, the current findings are also consistent with similar studies (Lange, 2000; Schilling et al., 2003; Schilling & Schwartz, 2004) measuring the effectiveness of dynamic seating instead of classroom chairs. The children who used dynamic seating interventions in the studies were more focused and attended better, which led to increased academic performance. In each of the studies using dynamic seating, the children demonstrated increased attention to task when permitted to actively move.

Limitations

One limitation of the study was the use of an observational form as a method to determine inclusion in the study. We developed the observational form on the basis of questions and information from the BRIEF. It is not a developed assessment tool and has not been established as a psychometrically valid screening tool. We developed the observational form specifically for use as a method to determine inclusion for this research study because limited tools were available to screen attention quickly. The teachers needed to complete the observational form for each member of their class, which was an extremely time-consuming process. Because content validity was not established with the observational form, it is possible that students were included in the study who did not have significant attentional issues or that students with attentional issues who should have been included were not. This limitation could result in a heterogeneous sample. The observational form was not used as measure of change before and after the intervention because of these limitations.

The results of the initial observational form may have been affected by the attitude and enthusiasm of the participating teachers. Teachers who were in favor of the study and interested in using the cushions in their classrooms appeared to have more students who met the inclusion criteria, a score of 15 or more, for participation in the study. Those teachers who were familiar with the use of the Disc 'O' Sit cushions seemed more accepting of their participation in the study. Teachers in classrooms with a higher incidence of behavior and learning problems seemed more enthusiastic to participate in the study.

Particular teaching styles may also have affected teachers' willingness to participate in the study. Those teachers who included movement activities in their second-grade daily schedule seemed to accept the introduction of the cushions into the classroom more readily. Those teachers with the ability to be flexible in their scheduling were also more accepting. In one school, the principal required the teachers to participate, even though their original reaction was to not participate. In that school, very few children qualified for the study, even though demographic information related to learning and attention problems was similar in all the schools. The results of this study were limited by a smaller sample

than originally expected related to teacher reaction to the study and parent permission slip acceptance.

Although results were significant, the effect size of the intervention on the dependent variables of GEC, BRI, and MI were only small to medium. Measures of effect when using ANOVA for analysis reflect the correlation between an effect and the dependent variable. Specifically, the effect in this study reflects "the proportion of variance in the dependent variable that can be attributable to the intervention" (Becker, 1999, p. 1). Therefore, it is possible that other factors also influenced the outcome of the study. These findings are consistent with more recent studies measuring sensory integration interventions (May-Benson, 2007), which have typically identified smaller effect sizes.

Another limitation was the lack of blinding of the teachers to group assignment. The teachers were aware of whether the students were in the control or intervention groups because the use of the Disc 'O' Sit cushion was often implemented by the teachers for the students and the use of the cushions was visible. Therefore, the possibility of experimental bias exists. The teachers may have expected changes based on the intervention and therefore reflected these in their responses on the posttest measures.

Future Research

Future research studying longer intervention periods is necessary to decrease teacher test–retest bias. In addition, pretest and posttest measures should be completed by raters who are unaware of group assignment. Research is also needed to determine the impact on school performance as measured through grades on academic test scores in subject areas. This approach would measure the ability to learn information while attending. It is suggested that a longer data collection period and a larger sample size be used in future research to generalize study results to a larger population. This study focused on a nonclinical population, which resulted in significant but small to medium effect size. It is suggested that future research focus on a clinical population because the effect of the intervention may vary on the basis of the targeted population.

Clinical Implications

With the implementation of the No Child Left Behind Act, school systems are searching for ways to improve academic performance (Hyun, 2003). Children innately can learn more readily if they are able to attend to task and absorb the information. This study has provided additional evidence suggesting that using dynamic seating such as the Disc 'O' Sit cushion can increase a child's attention to task. Individual academic improvement and national test scores may improve by providing the children with such cushions on a daily basis.

In comparison to many interventions, the Disc 'O' Sit cushions are relatively inexpensive and can be easily used with little stigma or distraction of the other students in the class. Teachers today have greater responsibilities with increasing expectations for their student's performance. As related services in the schools move toward consultation methods of interventions, the Disc 'O' Sit cushions provide an option of an intervention that can be easily implemented with minimal resources into a child's classroom routine under the supervision of the classroom teacher.

It is hypothesized that the Disc 'O' Sit cushion engages the proprioceptive and vestibular sensory systems when implemented. Because children with attention issues have been identified as being in states of underarousal, occupational therapists need to find appropriate and effective intervention methods such as the Disc 'O' Sit cushion that can help modulate arousal levels for optimal attention and learning. Additionally, therapists need to consider self-modulation when completing school-based occupational therapy evaluations because of its secondary implications on attention and learning.

Clinicians have been using dynamic seating systems such as the Disc 'O' Sit cushion for many years to assist with attention to task. Despite clinical evidence that these systems are getting the desired results, very little research has been completed and published to support their use. The use of evidence-based interventions is required of all occupational therapists who provide services under the Individuals With Disabilities Education Improvement Act of 2004 (IDEA, P.L. 108–446; Council for Exceptional Children, 2006). This change was required under the reauthorization of IDEA in 2004. Although further research is warranted, the current study provides documentation of evidence for the use of dynamic seating interventions such as the Disc 'O' Sit cushions in the classroom to improve attention.

Conclusion

The results of this experimental pretest–posttest study provide preliminary support for the use of dynamic seating cushions such as the Disc 'O' Sit cushion with children who are having difficulty attending to task in the academic setting. The results identified an increase in attention (as measured by the BRIEF) while engaged in sedentary tasks in the classroom. Additional research is needed to examine effectiveness of Disc 'O' Sit cushions with increasing attention to task for a wider age range and larger population of students in the school setting. ▲

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