

Effectiveness Studies of Ayres SI

2009

Wuang YP, Wang CC, Huang MH, & Su CY. (2009). Prospective study of the effect of sensory integration, neurodevelopmental treatment, and perceptual-motor therapy on the sensorimotor performance in children with mild mental retardation. *Am J Occup Ther.* 63(4),441-52.

OBJECTIVE: This quasi-experimental study compared the effect of sensory integrative (SI) therapy, neurodevelopmental treatment (NDT), and perceptual-motor (PM) approach on children with mild mental retardation. **METHOD:** Children (N = 120) were randomly assigned to intervention with SI, NDT, or PM; another 40 children served as control participants. All children were assessed with measures of sensorimotor function. **RESULTS:** After intervention, the treatment groups significantly outperformed the control group on almost all measures. The SI group demonstrated a greater pretest-posttest change on fine motor, upper-limb coordination, and SI functioning. The PM group showed significant gains in gross motor skills, whereas the NDT group had the smallest change in most measures. **CONCLUSION:** SI, NDT, and PM improved sensorimotor function among children with mild mental retardation. The choice of sensorimotor approaches should be determined on the basis of the child's particular needs because each approach may have an advantage in certain aspects of sensorimotor function.

Prior to 2009

Miller, L. J., Coll, J. R., & Schoen, S. A. (2007). A randomized controlled pilot study of the effectiveness of occupational therapy for children with sensory modulation disorder. *American Journal of Occupational Therapy*, 61, 228-238.

OBJECTIVE: A pilot randomized controlled trial (RCT) of the effectiveness of occupational therapy using a sensory integration approach (OT-SI) was conducted with children who had sensory modulation disorders (SMDs). This study evaluated the effectiveness of three treatment groups. In addition, sample size estimates for a large scale, multisite RCT were calculated. **METHOD:** Twenty-four children with SMD were randomly assigned to one of three treatment conditions; OT-SI, Activity Protocol, and No Treatment. Pretest and posttest measures of behavior, sensory and adaptive functioning,

and physiology were administered. RESULTS: The OT-SI group, compared to the other two groups, made significant gains on goal attainment scaling and on the Attention subtest and the Cognitive/Social composite of the Leiter International Performance Scale-Revised. Compared to the control groups, OT-SI improvement trends on the Short Sensory Profile, Child Behavior Checklist, and electrodermal reactivity were in the hypothesized direction. CONCLUSION: Findings suggest that OT-SI may be effective in ameliorating difficulties of children with SMD.

Miller, L. J., Schoen, S. A., James, K., & Schaaf, R. C. (2007). Lessons learned: A pilot study on occupational therapy effectiveness for children with sensory modulation disorder. *American Journal of Occupational Therapy*, 61, 161-169.

OBJECTIVE: The purpose of this pilot study was to prepare for a randomized controlled study of the effectiveness of occupational therapy using a sensory integration approach (OT-SI) with children who have sensory processing disorders (SPD). METHOD: A one-group pretest, posttest design with 30 children was completed with a subset of children with SPD, those with sensory modulation disorder. RESULTS: Lessons learned relate to (a) identifying a homogeneous sample with quantifiable inclusion criteria, (b) developing an intervention manual for study replication and a fidelity to treatment measure, (c) determining which outcomes are sensitive to change and relate to parents' priorities, and (d) clarifying rigorous methodologies (e.g., blinded examiners, randomization, power). CONCLUSION: A comprehensive program of research is needed, including multiple pilot studies to develop enough knowledge that high-quality effectiveness research in occupational therapy can be completed. Previous effectiveness studies in OT-SI have been single projects not based on a unified long-term program of research.

Watling RL, & Dietz J. (2007). Immediate effect of Ayres's sensory integration-based occupational therapy intervention on children with autism spectrum disorders. *AJOT*, 61, 574-83.

OBJECTIVE: This study examined the effects of Ayres' sensory integration intervention on the behavior and task engagement of young children with autism spectrum disorders (ASD). Clinical observations and caregiver reports of behavior and engagement also were explored to help guide future investigations. METHOD: This single-subject study used an ABAB design to

compare the immediate effect of Ayres's sensory integration and a play scenario on the undesired behavior and task engagement of 4 children with ASD. RESULTS: No clear patterns of change in undesired behavior or task management emerged through objective measurement. Subjective data suggested that each child exhibited positive changes during and after intervention. CONCLUSION: When effects are measured immediately after intervention, short-term Ayres's sensory integration does not have a substantially different effect than a play scenario on undesired behavior or engagement of young children with ASD. However, subjective data suggest that Ayres's sensory integration may produce an effect that is evident during treatment sessions and in home environments.

Mailloux Z, May-Benson TA, Summers CA, Miller LJ, Brett-Green B, Burke JP, Cohn ES, Koomar JA, Parham LD, Roley SS, Schaaf RC, & Schoen SA. (2007). Goal attainment scaling as a measure of meaningful outcomes for children with sensory integration disorders. *AJOT*, 61, 254-9.

Goal attainment scaling (GAS) is a methodology that shows promise for application to intervention effectiveness research and program evaluation in occupational therapy (Dreiling & Bundy, 2003; King et al., 1999; Lannin, 2003; Mitchell & Cusick, 1998). This article identifies the recent and current applications of GAS to occupational therapy for children with sensory integration dysfunction, as well as the process, usefulness, and problems of application of the GAS methodology to this population. The advantages and disadvantages of using GAS in single-site and multisite research with this population is explored, as well as the potential solutions and future programs that will strengthen the use of GAS as a measure of treatment effectiveness, both in current clinical practice and in much-needed larger, multisite research studies.

Schaaf RC, & Nightlinger KM. (2007). Occupational therapy using a sensory integrative approach: a case study of effectiveness. *AJOT*, 61, 239-46.

OBJECTIVE: This article presents a case report of a child with poor sensory processing and describes the disorders impact on the child's occupational behavior and the changes in occupational performance during 10 months of occupational therapy using a sensory integrative approach (OT-SI). METHOD:

Retrospective chart review of assessment data and analysis of parent interview data are reviewed. Progress toward goals and objectives is measured using goal attainment scaling. Themes from parent interview regarding past and present occupational challenges are presented. **RESULTS:** Notable improvements in occupational performance are noted on goal attainment scales, and these are consistent with improvements in behavior. Parent interview data indicate noteworthy progress in the child's ability to participate in home, school, and family activities. **CONCLUSION:** This case report demonstrates a model for OT-SI. The findings support the theoretical underpinnings of sensory integration theory: that improvement in the ability to process and integrate sensory input will influence adaptive behavior and occupational performance. Although these findings cannot be generalized, they provide preliminary evidence supporting the theory and the effectiveness of this approach.

Parham LD, Cohn ES, Spitzer S, Koomar JA, Miller LJ, Burke JP, Brett-Green B, Mailloux Z, May-Benson TA, Roley SS, Schaaf RC, Schoen SA, & Summers CA. (2007). Fidelity in sensory integration intervention research. *AJOT*, 61, 216-27.

OBJECTIVE: We sought to assess validity of sensory integration outcomes research in relation to fidelity (faithfulness of intervention to underlying therapeutic principles). **METHOD:** We identified core sensory integration intervention elements through expert review and nominal group process. Elements were classified into structural (e.g., equipment used, therapist training) and therapeutic process categories. We analyzed 34 sensory integration intervention studies for consistency of intervention descriptions with these elements. **RESULTS:** Most studies described structural elements related to therapeutic equipment and interveners' profession. Of the 10 process elements, only 1 (presentation of sensory opportunities) was addressed in all studies. Most studies described fewer than half of the process elements. Intervention descriptions in 35% of the studies were inconsistent with one process element, therapist-child collaboration. **CONCLUSION:** Validity of sensory integration outcomes studies is threatened by weak fidelity in regard to therapeutic process. Inferences regarding sensory integration effectiveness cannot be drawn with confidence until fidelity is adequately addressed in outcomes research.

Smith SA, Press B, Koenig KP, & Kinnealey M. (2005). Effects of sensory integration intervention on self-stimulating and self-injurious behaviors. *AJOT*, 59, 418-25.

This study compared the effects of occupational therapy, using a sensory integration (SI) approach and a control intervention of tabletop activities, on the frequency of self-stimulating behaviors in seven children 8-19 years of age with pervasive developmental delay and mental retardation. Daily 15-min videotape segments of the subjects were recorded before, immediately after, and 1 hour after either SI or control interventions performed during alternating weeks for 4 weeks. Each 15-min video segment was evaluated by investigators to determine the frequency of self-stimulating behaviors. The results indicate that self-stimulating behaviors were significantly reduced by 11% one hour after SI intervention in comparison with the tabletop activity intervention ($p = 0.02$). There was no change immediately following SI or tabletop interventions. Daily ratings of self-stimulating behavior frequency by classroom teachers using a 5-point scale correlated significantly with the frequency counts taken by the investigators ($r = 0.32$, $p < 0.001$). These results suggest that the sensory integration approach is effective in reducing self-stimulating behaviors, which interfere with the ability to participate in more functional activities.