

The Effectiveness of Sensory-based Interventions for Children and Youth: A Systematic Review

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Full Definition of Terms

For this systematic review, we used the following definitions for sensory interventions:

- “Sensory technique” is defined as the application of particular sensory stimuli, or the provision of materials and activities that provide particular types of sensory stimuli, by direct application to the child’s body or by the child’s body being placed directly on or in an object or device (e.g., sitting on a therapy ball or wearing a compression device). Interventions without any mention of ASI fidelity were included as sensory techniques.
- “Sensory environmental modification” is defined as a compensatory intervention in which a change is made in the intensity, complexity, or quality of one or more sensory elements in the ambient physical environment surrounding the child to support child functioning and participation.
- “Caregiver-focused interventions” is defined as working with a child’s caregiver (e.g., parent, guardian, teacher, coach, babysitter, sibling, etc. who attends to the needs or looks after a child) to provide support for the sensory needs of a child who exhibits challenges in sensory processing and integration of sensory information. Interventions are

designed to occur in the natural context and support participation of the child and group of which the child is a member.

References

- *Benson, J. D., Morgus, K., Donoso Brown, E., & Smitsky, D. (2019). The effect of alternate seating on improving attention and in-seat behavior of preschoolers with autism: A pilot study. *Journal of Occupational Therapy, Schools, & Early Intervention*, 12, 455-465.
<https://doi.org/10.1080/19411243.2019.1672606>
- *Benson, J. D., Donoso Brown, E. V., Blough, A., & Smitsky, D. (2020). The effect of sensorimotor strategies on attention and in-seat behavior in preschoolers with autism spectrum disorder: A pilot study. *Journal of Occupational Therapy, Schools, & Early Intervention*, 13, 236-249. <https://doi.org/10.1080/19411243.2020.1732262>
- *Benson, J. D., Blaskowitz, M. G., Collins, A., Smitsky, D., Chippich, E., & Connell, C. (2022). The effect of a sensory activity schedule (SAS) on the on-task behaviors of children with autism spectrum disorders. *Journal of Occupational Therapy, Schools, & Early Intervention*, 15, 439-454. <https://doi.org/10.1080/19411243.2021.2003734>
- *Durgut, E., Oregul, A. C., & Algun, Z. C. (2020). Comparison of the effects of treadmill and vibration training in children with attention deficit hyperactivity disorder: A randomized controlled trial. *NeuroRehabilitation*, 47, 121-131. <https://doi.org/10.3233/NRE-203040>
- *Graziano, P. A., Garcia, A. M., & Landis, T. D. (2020). To fidget or not to fidget, that is the question: A systematic classroom evaluation of fidget spinners among young children with ADHD. *Journal of Attention Disorders*, 24, 163-171.
<https://doi.org/10.1177/1087054718770009>

*Heyburn, K., Shaw, D., Carbert, K., & Thompson-Hodgetts, S. (2023). “Sensory in-Service”: An Exploratory Evaluation of a Group-Based, Caregiver Intervention for Children with Sensory Processing Difficulties. *Physical & Occupational Therapy In Pediatrics*, 43, 228-242. <https://doi.org/10.1080/01942638.2022.2104151>

*Ikuta, N., Iwanaga, R., Tokunaga, A., Nakane, H., Tanaka, K., & Tanaka, G. (2016). Effectiveness of earmuffs and noise-cancelling headphones for coping with hyper-reactivity to auditory stimuli in children with autism spectrum disorder: A preliminary study. *Hong Kong Journal of Occupational Therapy*, 28(1), 24-32. <https://doi.org/10.1016/j.hkjot.2016.09.001>

*Kim, G., Carrico, C., Ivey, C., & Wunsch, P. B. (2019). Impact of sensory adapted dental environment on children with developmental disabilities. *Special Care in Dentistry*, 39, 180-187. <https://doi.org/10.1111/scd.12360>

*Koshy, N. M., Sugi, S., & Rajendran, K. (2018). A study to identify prevalence and effectiveness of sensory integration on toilet skill problems among sensory processing disorder. *The Indian Journal of Occupational Therapy*, 50, 86-91. <https://doi.org/10.4103/0445-7706.244548>

*Krombach, T., & Miltenberger, R. (2020). The effects of stability ball seating on the behavior of children with autism during instructional activities. *Journal of Autism and Developmental Disorders*, 50, 551-559. <https://doi.org/10.1007/s10803-019-04283-8>

*Lönn, M., Svedberg, P., Nygren, J., Jarbin, H., Aili, K., & Larsson, I. (2024). The efficacy of weighted blankets for sleep in children with attention-deficit/hyperactivity disorder—A randomized controlled crossover trial. *Journal of Sleep Research*, 33, e13990. <https://doi.org/10.1111/jsr.13990>

- *Lu, W. P., Tsai, W. H., Lin, L. Y., Hong, R. B., & Hwang, Y. S. (2019). The beneficial effects of massage on motor development and sensory processing in young children with developmental delay: A randomized control trial study. *Developmental Neurorehabilitation*, 22, 487-495. <https://doi.org/10.1080/17518423.2018.1537317>
- *Macphee, F. L., Merrill, B. M., Altszuler, A. R., Ramos, M. C., Gnagy, E. M., Greiner, A. R., ... & Pelham, W. E. (2019). The effect of weighted vests and stability balls with and without psychostimulant medication on classroom outcomes for children with ADHD. *School Psychology Review*, 48, 276-289. <https://doi.org/10.17105/SPR-2017-0151.V48-3>
- *Mah, J. W., & Doherty, M. (2021). Sensorimotor intervention group for children with ADHD and sensory processing difficulties: A feasibility study. *Journal of Child and Family Studies*, 30, 447-459. <https://doi.org/10.1007/s10826-021-01900-y>
- *Mah, J. W., Gill, H., & Doherty, M. (2023). Feasibility and Efficacy of the Alert Program® for children with attention-deficit/hyperactivity disorder. *Clinical child psychology and psychiatry*, 28, 924-936. <https://doi.org/10.1177/13591045231162680>
- *Nielsen, A. N., la Cour, K., & Brandt, Å. (2023). Teachers' and parents' assessment of challenges in children exhibiting sensory seeking behavior and possible effects of the use of ball vests: A pre-post study. *Children*, 10, 1800. <https://doi.org/10.3390/children10111800>
- *Padmanabha, H., Singhi, P., Sahu, J. K., & Malhi, P. (2019). Home-based sensory interventions in children with autism spectrum disorder: A randomized controlled trial. *The Indian Journal of Pediatrics*, 86, 18-25. <https://doi.org/10.1007/s12098-018-2747-4>
- *Pashazadeh Azari, Z. P., Hosseini, S. A., Rassafiani, M., Samadi, S. A., Hoseinzadeh, M., & Dunn, W. (2019). Contextual intervention adapted for autism spectrum disorder: An RCT

of a parenting program with parents of children diagnosed with ASD. *Iranian Journal of Child Neurology*, 13(4), 19-35. <https://doi.org/10.22037/ijcn.v13i4.21156>

*Pingale, V., Fletcher, T. S., Candler, C., Pickens, N., & Dunlap, K. (2022). Effects of sensory diets: A single subject study. *Journal of Occupational Therapy, Schools, & Early Intervention*, 15, 165-180. <https://doi.org/10.1080/19411243.2021.1941492>

*Spira, G. (2021). A sensory intervention to improve sleep behaviours and sensory processing behaviours of children with sensory processing disorders. *Irish Journal of Occupational Therapy*, 49(1), 11-20. <https://doi.org/10.1108/IJOT-09-2020-0014>

*Voola, S. I. & Kumari, V. M (2022). Sensory garden: Piloting an affordable nature-based intervention for function behavior of children with attention deficit hyper activity disorder (ADHD). *Current Pediatric Research*, 26, 1381–1385.
<https://doi.org/10.35841/0971-9032.26.4.1381-1385>.