

Preliminary Efficacy of a Sensory-Adapted Dental Environment to Improve Dental Care for Children With Autism Spectrum Disorder

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BACKGROUND: Many children with autism spectrum disorder (ASD) have poorer oral health and greater oral care challenges compared to typically developing (TD) children. Prior research suggests these challenges are associated with sensory over-responsivity (SOR) which may lead to distressing oral care experiences, ultimately discouraging parents from ensuring proper oral care in their child with ASD.

PURPOSE: It is important to identify innovative solutions that enable dentists to perform standard clinic-based procedures for children with ASD. This study examined the efficacy of a sensory adapted dental environment to reduce physiological and behavioral distress in children with ASD undergoing dental cleanings.

METHOD: Participants were 151 children ages 6-12 years. In an experimental crossover design, children underwent two dental cleanings, one in a regular dental environment (RDE) and one in a sensory adapted dental environment (SADE), administered in a randomized and counterbalanced order approximately six months apart. Visual, auditory, and tactile stimuli were modified in the SADE. Outcomes included: (1) physiological stress and anxiety measured by electrodermal activity, a non-invasive way to measure sympathetic nervous system activation; (2) behavioral distress measured by two dentist-report surveys (Frankl Scale; Anxiety and Cooperation Scale) and objective coding of video-recordings of children's behavior by researchers (Children's Dental Behavior Rating Scale); and (3) child- and parent-report satisfaction with the SADE. Mixed effects regression models were performed with adjustments for attained age and visit order.

RESULTS: Implementation of the SADE had high satisfaction as reported by caregivers (overall mean 4.6 out of 5) and children (overall mean 4.2 out of 5). In addition, parents overwhelmingly agreed that the SADE made their child's experience better (overall mean 4.4 out of 5). Significantly lower physiological stress and anxiety was found in the SADE condition, compared to the RDE, in all phases of the dental visit – baseline ($p < .0001$), oral examination ($p < .05$), prophylaxis/cleaning ($p = .02$), and fluoride application ($p = .003$), suggesting decreased sympathetic activity and increased relaxation during dental care in the SADE. No significant differences were found based on measures of overt behavioral distress.

CONCLUSION: Enhancing oral care is critical for children with special health care needs. Using a SADE during dental cleanings is a highly satisfying experience for children with ASD and their caregivers, and is efficacious in decreasing physiological distress during care. These findings highlight the potential for OTs to be part of an interdisciplinary team in oral health settings; collaboration with dentistry is a new and evolving area for OT practice and research.

IMPACT: This study contributes knowledge about the use of sensory integration concepts in dentistry. OTs can be key players in oral health, spearheading collaborations to investigate adapting the dental experience for this population. The use of a SADE has the potential to improve oral care for children.

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