

## BACKGROUND

Estimates suggest that approximately 15–20% of the world’s population experiences some form of neurodivergence. While this represents a significant minority, the majority of pediatric dental patients remain neurotypical. A major research gap exists regarding the effects of a Comprehensive Sensory-Adapted Dental Environment (C-SADE) on neurotypical children. Sensory processing disorder (SPD) affects how the brain responds to sensory stimuli and may cause heightened or reduced sensitivity to sounds, lights, textures, tastes, and environmental cues. The regular dental environment (RDE) often fails to accommodate these sensory needs. Dental visits can be overwhelming and distressing for children with SPD, frequently leading to avoidance of oral care. In 2025, Mahmud introduced the C-SADE, which engages all seven sensory domains and was developed specifically for children with SPD, independent of autism spectrum disorder (ASD). Prior research has demonstrated that C-SADE significantly reduces anxiety and improves behavioral cooperation in children with SPD and is a scalable, evidence-based innovation suitable for real-world clinical implementation.

## CURRENT GAPS

Despite evidence supporting C-SADE for children with SPD, its effects on neurotypical children remain unclear. Understanding whether sensory-adapted environments benefit neurotypical pediatric patients could broaden the clinical applicability of C-SADE in pediatric dentistry.

## PRIMARY OBJECTIVE

To determine whether C-SADE reduces dental anxiety and improves behavioral cooperation in neurotypical children compared to the RDE.

## METHODS

Ten neurotypical children aged 4–11 years participated in a randomized crossover study. Each child attended two dental visits at least three months apart: one visit in an RDE and one visit in a C-SADE. Anxiety was assessed pre- and post-operatively using the Mahmud Visual FACES Anxiety Scale. Parental feedback was collected following each visit.

## RESULTS

- Post-operative anxiety scores were lower in the C-SADE visit compared with the RDE visit using the Mahmud Visual FACES Anxiety Scale.
- Parental feedback indicated a strong preference for C-SADE.
- One hundred percent of parents reported they would prefer C-SADE for future dental visits.

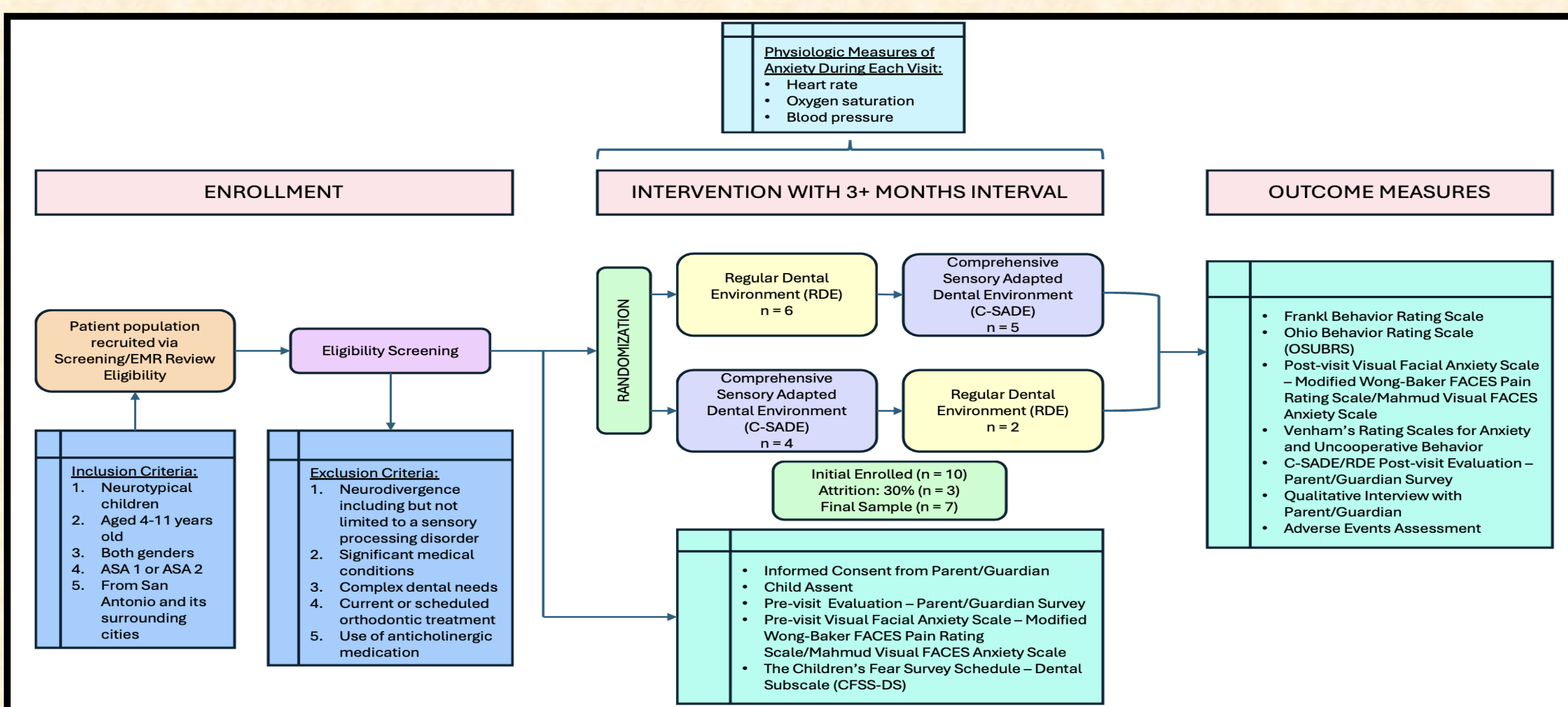


Figure 1: Crossover Randomized Control Trial Schema

## PARENTAL FEEDBACK

- “It was definitely a much more calm environment.”
- “The immediate response to the sensory room was much more favorable.”
- “They were feeling very comfortable about the treatment.”
- “She was calm, not anxious at all, very excited to be here and be a part of the environment.”
- “She seemed very excited and not scared at all.”
- “He felt more comfort.”

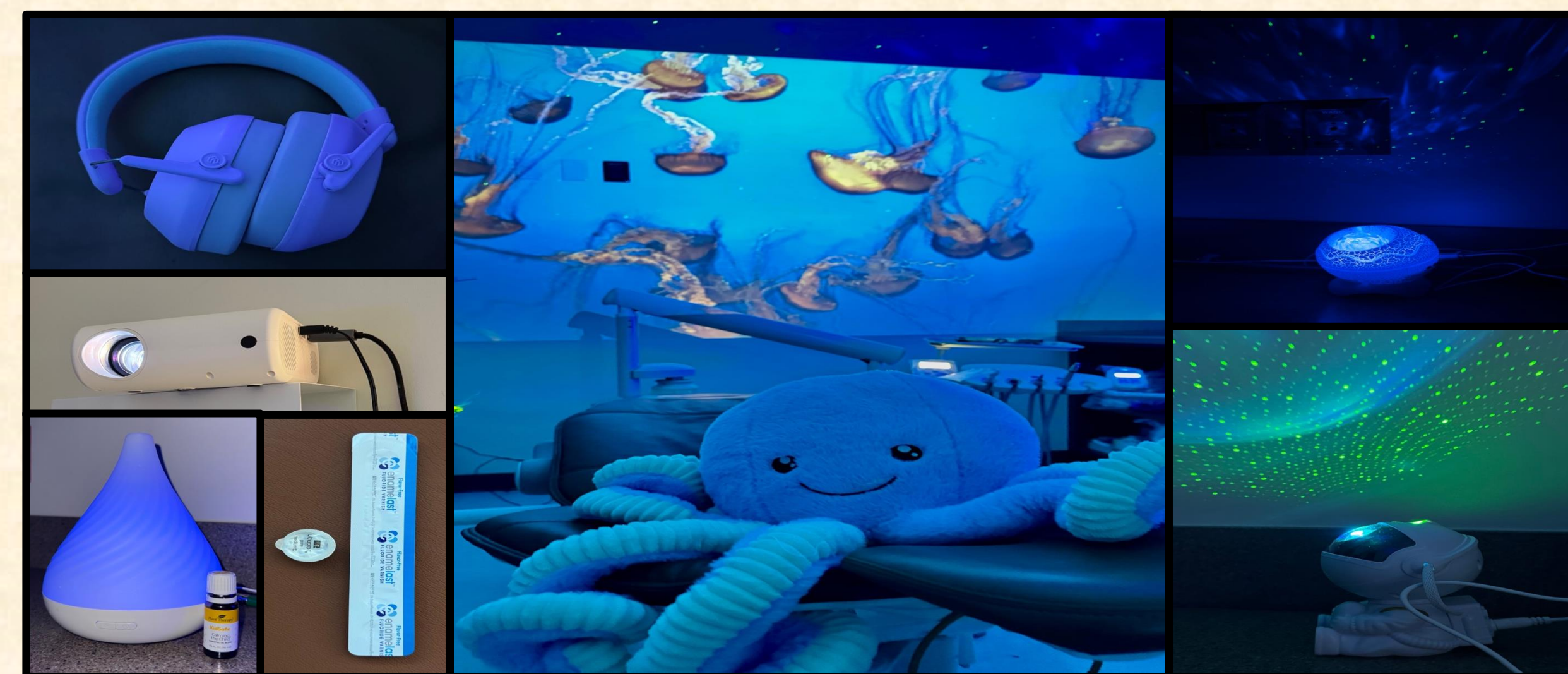


Figure 2: Components of C-SADE

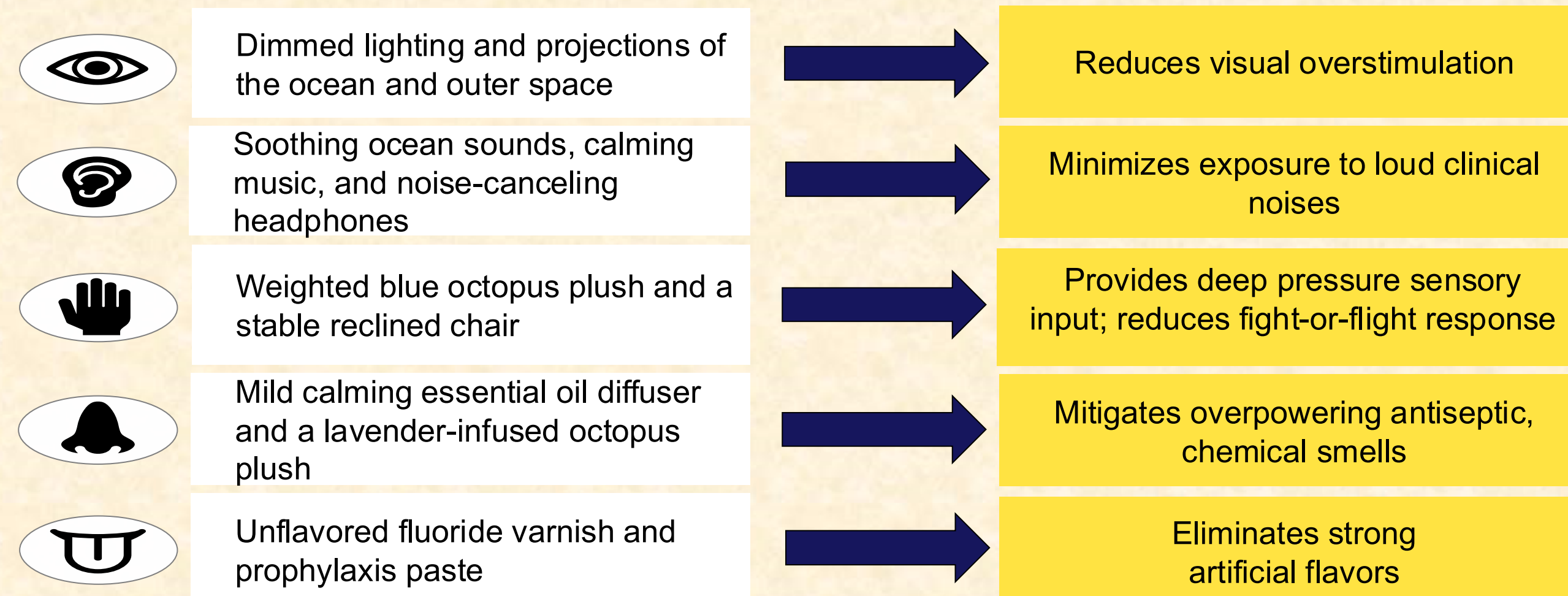


Figure 3: RDE

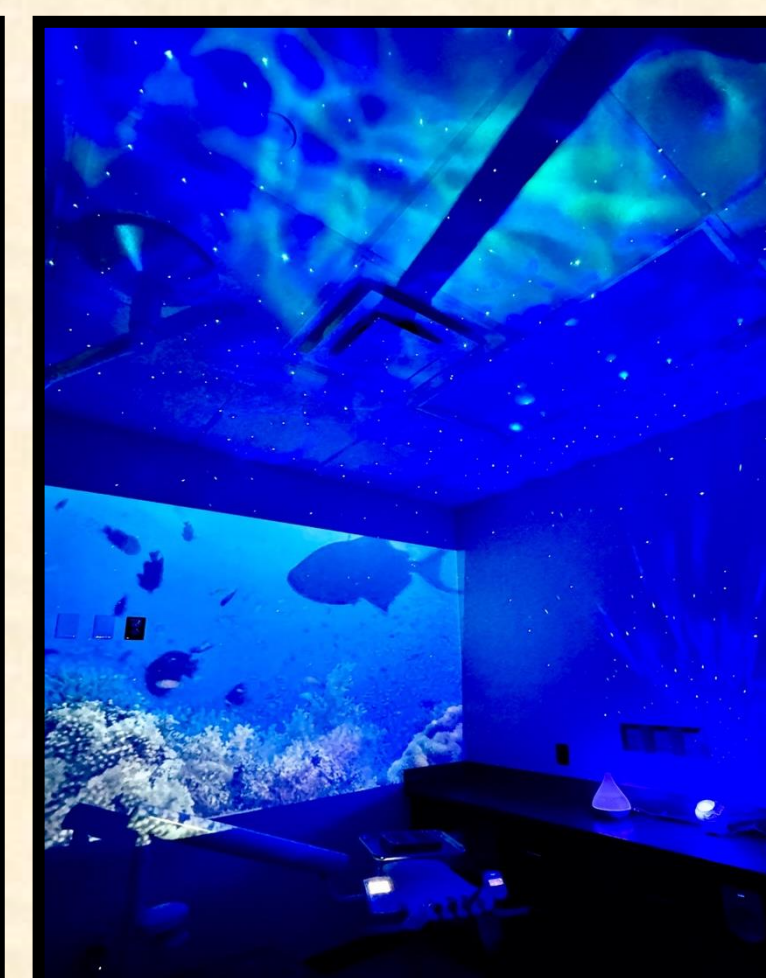


Figure 4: C-SADE

## CONCLUSIONS

- Neurotypical patients also benefit from C-SADE.
- Parents and patients prefer C-SADE over RDE.
- Due to the limited sample size, which reduces the statistical power and generalizability of the findings, further research with a larger, more representative cohort is required to validate these results.

