

Integrating Occupational Therapy with Applied Behavior Analysis to Promote Dental Health for Children with Down Syndrome



Thomas Symons B.S., Naomi Edwin, DO, Sarimar Guzman Hernandez, MD, Stacey McConkey, MD, Kelly Gekas Conway, OTR/L, BCP

Introduction

Children with Down syndrome (DS) have higher rates of periodontal disease than their typically developing peers. Contributing factors include decreased fine motor skills, abnormal oral anatomy, reduced salivation, and leukocyte dysfunction. Behavioral and sensory barriers, including dental anxiety and difficulty tolerating oral stimulation, make both home care and dental visits harder for this population.

Background

ABA uses positive reinforcement and environmental modification to build functional skills in children with intellectual disabilities. Evidence supports its effectiveness in reducing adverse behaviors and developing daily living skills, and caregiver-delivered ABA via telehealth has shown early promise. No program to date has combined OT and ABA specifically to target oral hygiene in young children with DS, a meaningful gap given the oral health burden this population carries

Objectives

This project evaluates a 5-week OT program integrating ABA principles to:

- Improve toothbrushing and flossing skills in children with DS ages 4–10
- Reduce behavioral and sensory barriers to oral care and dental visits
- Build caregiver confidence in using ABA strategies at home

Methods

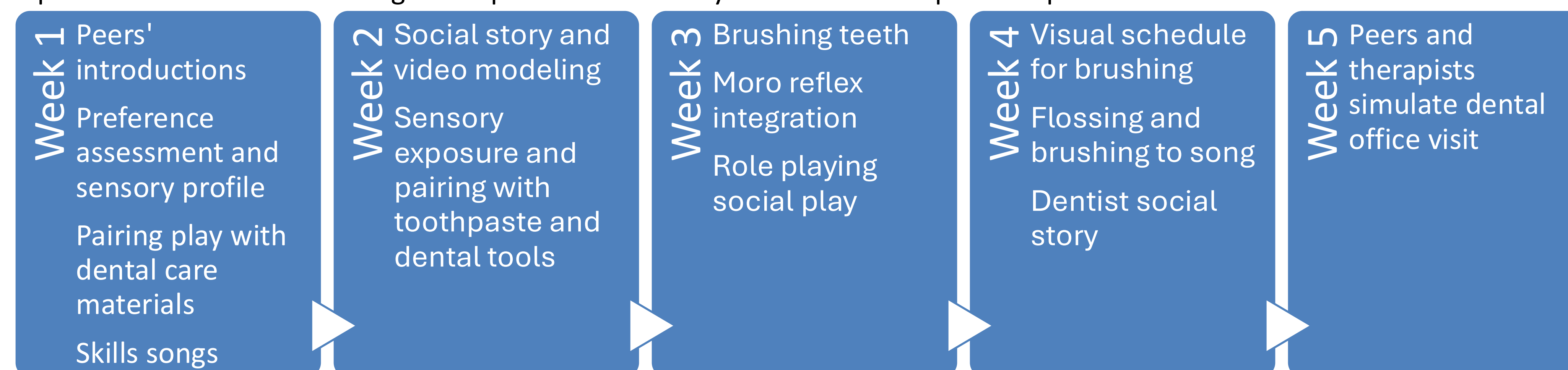
Participants: Children ages 4–10 with Down syndrome, treated at AdventHealth Sports Med and Rehab in collaboration with Rollins College student volunteers.

Intervention: Five consecutive weekly 1-hour group therapy sessions (group format leverages DS children's positive response to social engagement). Each session applies ABA strategies including:

Task analysis of oral hygiene steps

- Graduated sensory desensitization (sensory diet development)
- Positive reinforcement of target behaviors
- Parallel caregiver ABA training + progressive home exercise program (HEP)
- Weekly family goal-setting (brushing, flossing, understanding dental health)

Data collection: Outcome measures were collected before the first session and after completion of the five-week intervention. Behavioral cooperation during oral care activities was assessed using the Frankl Behavioral Rating Scale. Progress toward intervention outcomes was evaluated using Goal Attainment Scaling (GAS). Caregiver-reported oral health knowledge, confidence, and home oral care practices were assessed using an 18-point intake survey administered at pre- and post-intervention.



Results

Six children with DS ages 4–10 were enrolled. Three withdrew : one gained enough independence with a vibration toothbrush to no longer need the program, one had a change in family circumstances, and one had difficulty with transportation. The remaining three finished all five sessions.

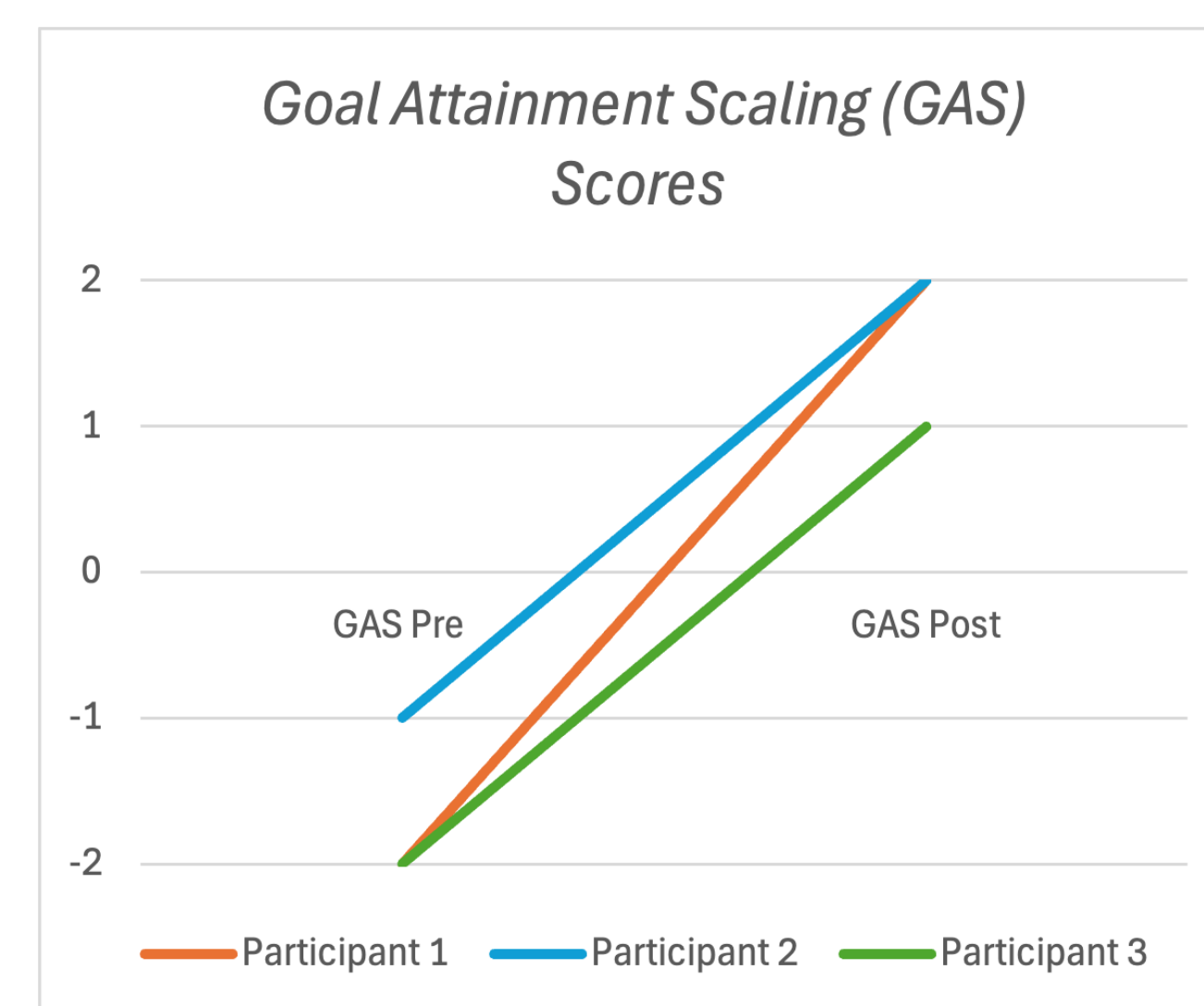


Figure 1. Changes in Goal Attainment Scaling (GAS) scores.

Individualized goals included tolerating tooth vibration for 30 seconds intervals (Participant 1), complying with a complete dental examination including flossing (Participant 2), and voluntarily opening the mouth for oral care (Participant 3). All participants demonstrated improvement from baseline to follow-up.

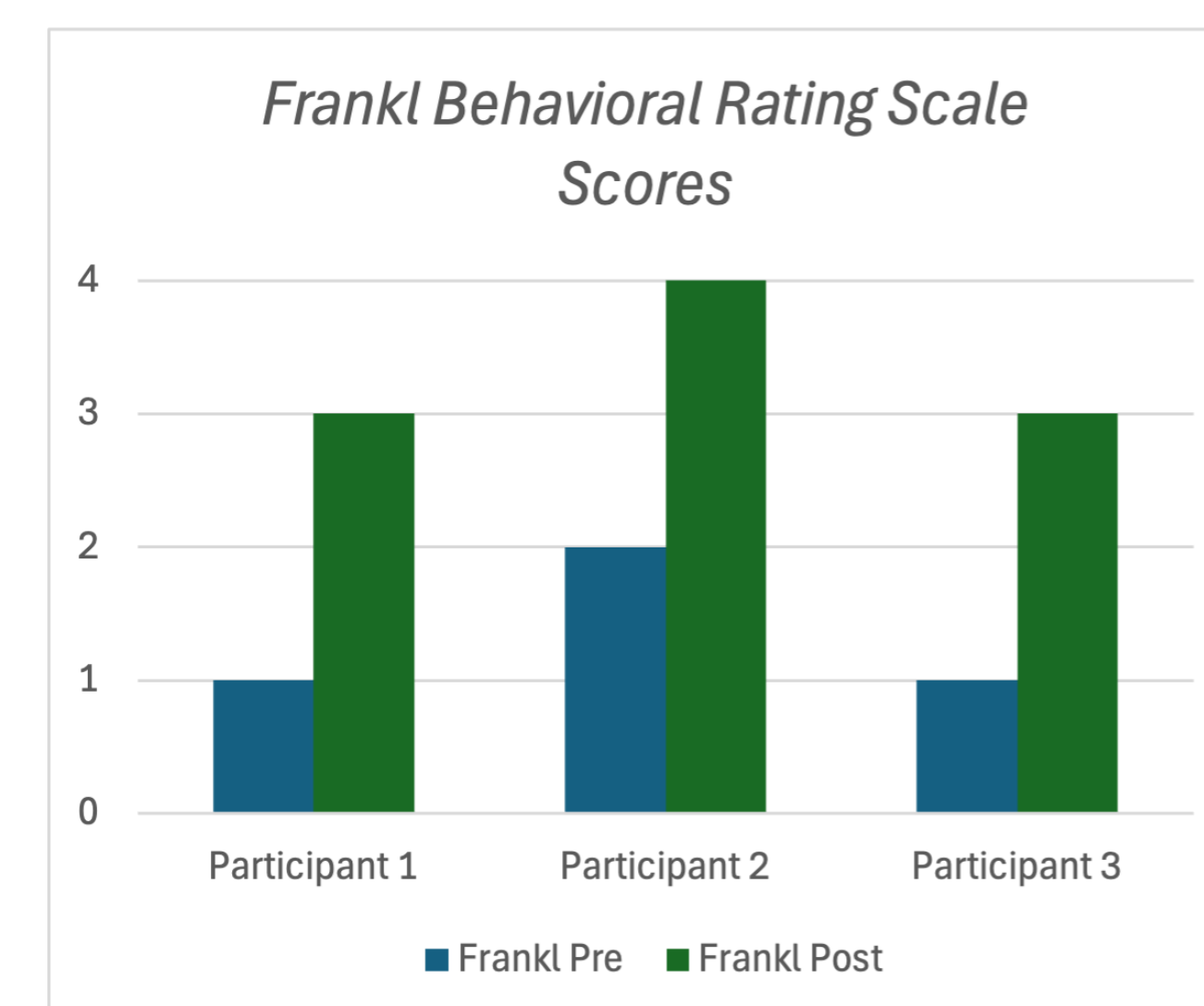


Figure 2. Changes in Frankl Behavioral Rating Scale scores.

Individual participant scores increased from baseline to follow-up, indicating improved cooperation and treatment engagement.

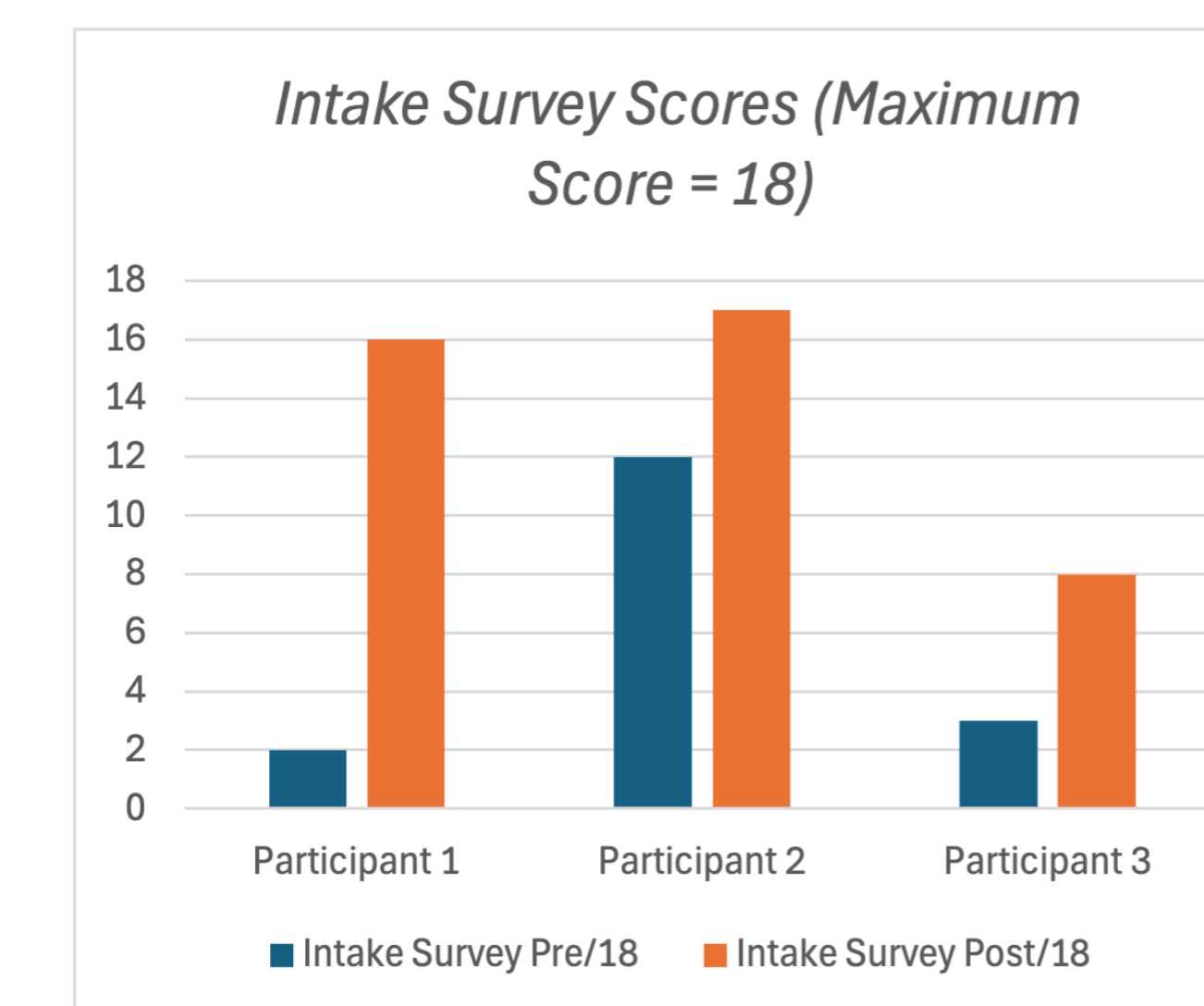


Figure 3. Changes in Intake Survey scores.

Intake survey scores increased for all participants, reflecting improvement in the targeted outcomes.



Clinical Significance

Poor oral health in children with DS affects eating, sleep, speech, and self-esteem, and contributes to avoidance of dental care that compounds disease burden over time. Existing barriers, including sensory sensitivity, limited fine motor control, and behavioral challenges at the dentist, are not well addressed by standard dental care models. This program offers a structured, low-cost group model that targets those barriers directly, using evidence-based strategies already familiar to the OT and ABA fields.

Conclusion

This pilot shows that a structured 5-week OT+ABA group program can lead to meaningful improvements in children with DS, even when they are starting from different places. Because baseline skills varied across participants, results are better understood as individual progress than group averages.

The group format kept costs around \$250 per participant, which is low compared to the downstream costs of untreated dental disease, including dental work requiring anesthesia. Future directions include bringing in ABA to help classify behaviors using ABC behavior assessment before enrollment, adding a pre-visit component to identify behavioral patterns, and tracking behavioral data across all sessions to see how things shift over time. Exploring a larger scale of this model could give children with Down Syndrome a low-cost, replicable option for addressing oral health disparities in this population.

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