

# THE IMPACT OF AUDIOVISUAL AIDS ON THE BEHAVIOR OF CHILDREN WITH AUSTISM SPECTRUM DISORDER DURING DENTAL VISITS

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## INTRODUCTION

Individuals with Autism Spectrum Disorder (ASD) often face significant challenges during dental visits. Traditional approaches such as sedation or restraint pose ethical and practical concerns, making it critical to explore alternative, patient-centered interventions. Audiovisual (AV) aids, including video modeling, calming music, and interactive tools, have shown potential in creating sensory-friendly environments and enhancing patient cooperation. The goal of this research was to evaluate the effectiveness of audiovisual aids in improving the dental care experience and outcomes for individuals with ASD.

## PURPOSE

Children with autism spectrum disorder (ASD) often experience heightened sensory sensitivities, anxiety, and behavioral challenges during dental treatment, making routine care difficult. Audiovisual (AV) distraction has been explored as a non-pharmacologic strategy to improve cooperation. This study evaluated whether installing a ceiling-mounted television in a pediatric special-needs operatory improved behavioral outcomes in children with ASD using the Frankl Behavior Rating Scale and Task Analysis Score (TAS).

## METHODOLOGY

A retrospective chart review was conducted at Nova Southeastern University's Mailman Segal Dental Clinic. Records from children aged 3–10 years with a documented ASD diagnosis were included. Behavioral data from before and after installation of a ceiling-mounted television (April 13, 2023) were compared. Pre-intervention data spanned April 13, 2022–April 13, 2023; post-intervention data spanned April 13, 2023–April 13, 2024. Frankl scores (1–4) and TAS scores (0–100) from the first three visits were analyzed using descriptive statistics and paired-samples analyses in SPSS v28.

## RESULTS

Mean TAS scores increased from 65.4 to 81.7 after TV installation, and mean Frankl scores improved from 2.4 to 3.1. Repeated measures ANOVA showed significant improvements for both TAS ( $F(1,198) = 42.37, p < .001$ ) and Frankl scores ( $F(1,198) = 36.82, p < .001$ ).

## RESULTS

The Mean Patient Age was 5.36 (SD=1.68, range 2-8).

Baseline Patient Characteristics (N=45)

Variable	%	%
Gender		
Male	6	11.3%
Female	39	86.7%
Race		
White	26	57.8%
African American	8	17.8%
Other	8	17.8%
Asian	3	6.7%
Ethnicity		
Hispanic	14	31.1%
Non-Hispanic	30	66.7%
Not reported	1	2.2%

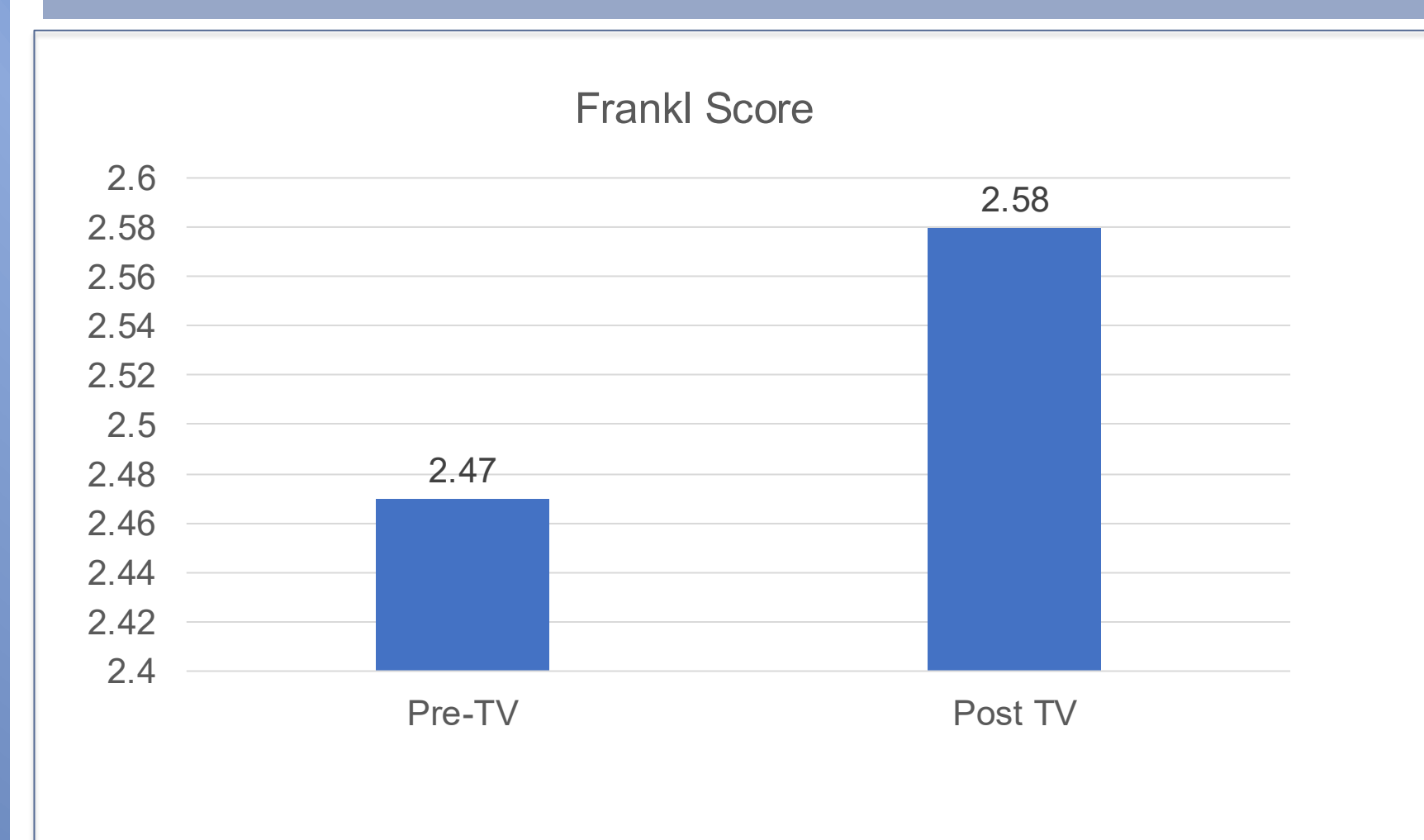
Baseline Patient Characteristics (N=45)

Variable	N	%
Caregiver anticipated level of cooperation		
Age appropriate	10	22.2%
Short attention span	10	22.2%
Aggressive	9	20.0%
Do not know	9	20.0%
Non-focused	5	11.1%
Playful	2	4.4%
Management techniques suggested by caregiver		
Multiple visits	18	40.0%
Don't know	18	40.0%
Sedation	9	20.0%
Restraint	3	6.7%
Other	5	11.1%
Watching TV helps child focus or stay calm in challenging situations		
Yes	44	97.8%
No	1	2.2%

Baseline Patient Characteristics (N=45)

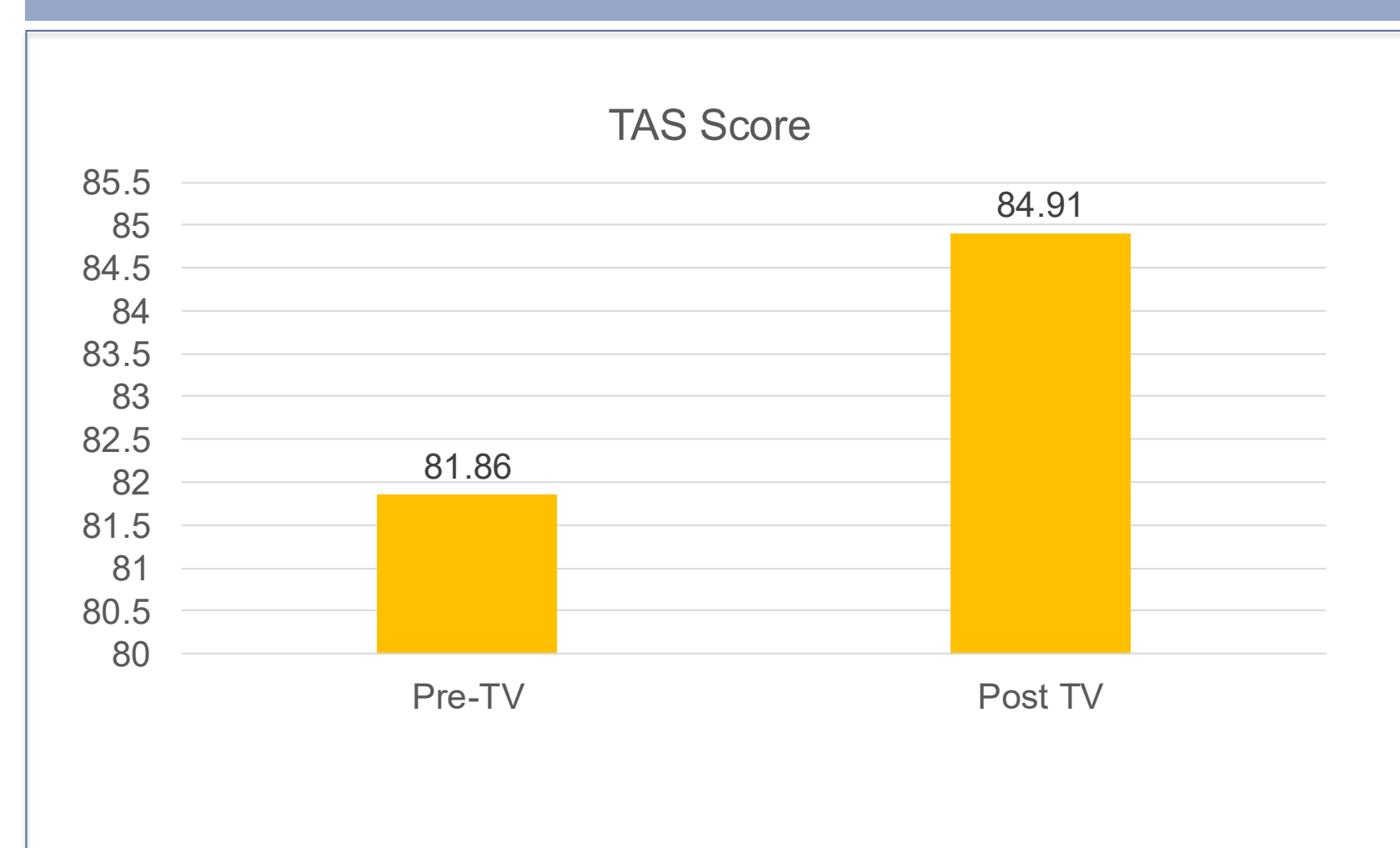
Variable	N	%
Child diagnosed with ASD	45	100%
Caregiver Description of child's ASD		
Mild	20	44.4%
Moderate	20	44.4%
Severe	2	4.5%
Other	3	6.7%
Level of challenging behaviors		
Mild (manageable with minimal intervention)	14	31.1%
Moderate (requires active intervention)	28	62.2%
Severe (disruptive and difficult to manage)	2	4.4%
None	1	2.2%
Frequency of challenging behavior		
Rarely (less than once a week)	9	20.0%
Daily	4	8.9%
Multiple times a day	32	71.1%
Co-occurring diagnosis		
Speech disorder	21	46.7%
Developmental delay	9	20.0%
Other	10	33.3%
Services received		
Occupational therapy	18	40%
Speech therapy	21	46.7%
Behavior therapy	14	31.1%
Physical therapy	4	8.9%
Other	4	8.9%

## T-test Results: Frankl Score



Although patient cooperation and behavior (measured Frankl score) improved before and after TV installation (2.47 versus 2.58), the results were not statistically significant ( $p=0.32$ ).

## T-test Results: TAS Score

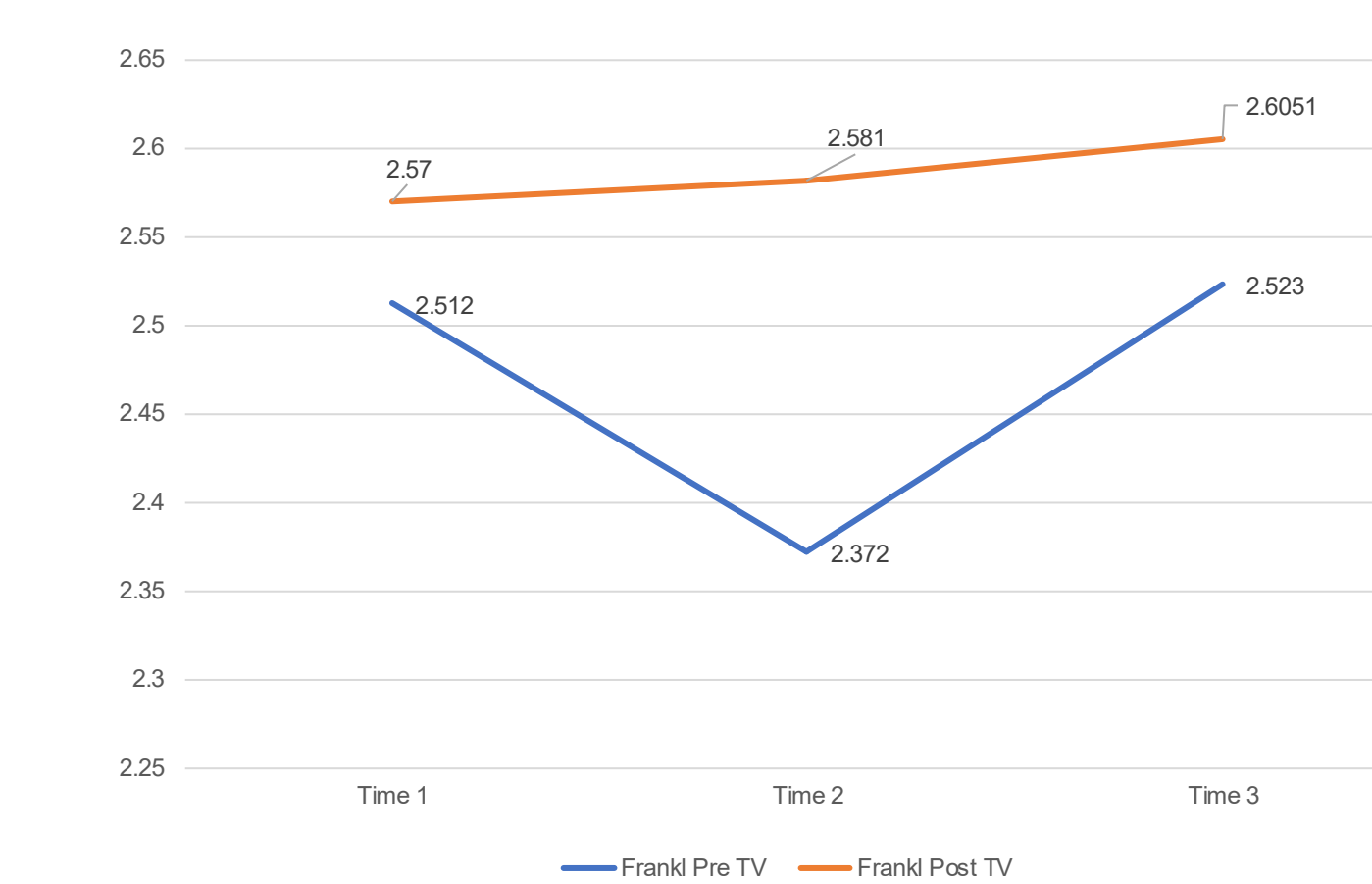


Although productivity and tasks completed during the visit (as measured by TAS score) improved before and after TV installation (81.86 versus 84.91), the results were not statistically significant ( $p=0.32$ ).

## RESULTS

Mean Plaque Scores

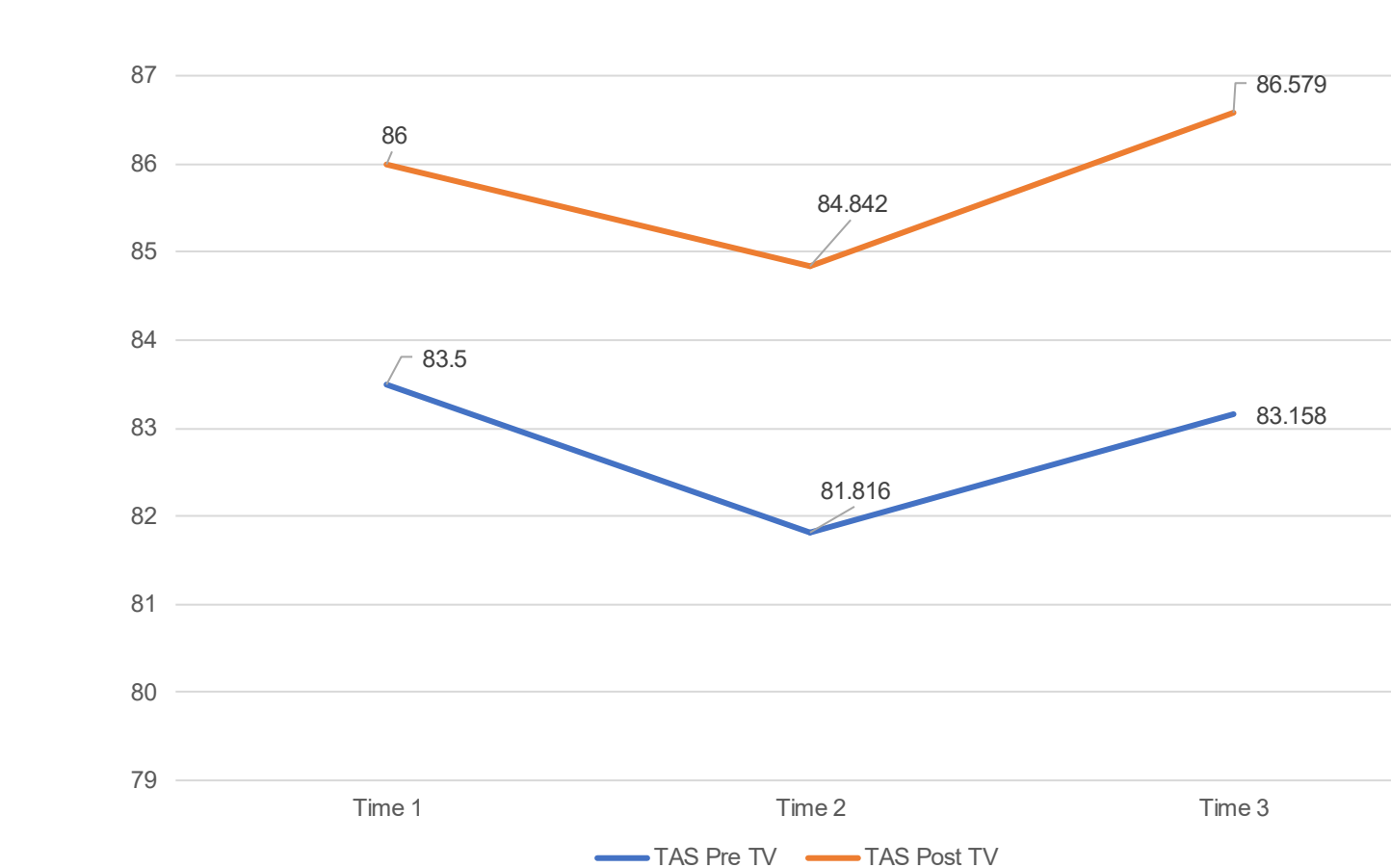
Frankl Score	Mean
Frankl time 1 prior to TV	2.512
Frankl time 2 prior to TV	2.372
Frankl time 3 prior to TV	2.523
Frankl time 1 post TV	2.570
Frankl time 2 post TV	2.581
Frankl time 3 post TV	2.6051



Analysis of average Frankl scores demonstrated notable differences in cooperative behavior and emotional responses before and after the installation of the television. During the pre-TV period, mean Frankl scores showed variability across time points, beginning at 2.512 at Time 1, decreasing to 2.372 at Time 2, and rising again to 2.523 at Time 3. In contrast, post-TV scores displayed a stable and consistently upward pattern, increasing from 2.570 at Time 1 to 2.581 at Time 2 and reaching 2.605 at Time 3. Although the magnitude of these changes was modest, the overall trend indicates that children with ASD demonstrated slightly more positive behavior and improved cooperation following the introduction of audiovisual distraction. This steady improvement in post-TV scores, compared with the fluctuations observed in the pre-TV period, supports the hypothesis that the presence of a ceiling-mounted television contributed to enhanced behavioral outcomes during dental visits.

Average TAS Scores

TAS Score	Mean
TAS time 1 prior to TV	83.500
TAS time 2 prior to TV	81.816
TAS time 3 prior to TV	83.158
TAS time 1 post TV	86.000
TAS time 2 post TV	84.842
TAS 3 post TV	86.579



Analysis of the Task Analysis Scores revealed clear differences in procedural cooperation before and after the installation of the television. During the pre-TV period, TAS scores demonstrated a slight decline from 83.500 at Time 1 to 81.816 at Time 2, followed by a modest recovery to 83.158 at Time 3, indicating some variability and lower task compliance mid-series. In contrast, post-TV TAS scores were consistently higher across all time points, beginning at 86.000 at Time 1, dipping slightly to 84.842 at Time 2, and rising again to the highest observed score of 86.579 at Time 3. Although the changes were moderate, the overall pattern shows that children with ASD completed more procedural steps and demonstrated improved cooperation following the introduction of the ceiling-mounted television. The consistently elevated TAS scores in the post-TV condition, compared with the lower and more variable scores prior to installation, support the hypothesis that audiovisual distraction enhanced task compliance during dental visits.

Descriptive analyses demonstrated notable improvements in both cooperation and behavioral outcomes following the installation of the television in the dental operatory. Mean Task Analysis Scores (TAS) increased from 65.4 (SD = 12.8) prior to installation to 81.7 (SD = 9.5) after installation, indicating greater task compliance and procedural cooperation. Similarly, Frankl scores improved from an average of 2.4 (SD = 0.6) in the pre-TV group to 3.1 (SD = 0.5) in the post-TV group, reflecting more positive behavioral responses and reduced distress. Repeated measures ANOVA revealed statistically significant differences between pre- and post-intervention scores for both TAS,  $F(1, 198) = 42.37, p < .001$ , and Frankl scores,  $F(1, 198) = 36.82, p < .001$ . Collectively, these findings indicate that the audiovisual intervention—specifically, the installation of a ceiling-mounted television—significantly improved cooperation and decreased negative behaviors in children with autism spectrum disorder during dental visits.

## CONCLUSIONS

Audiovisual distraction improved cooperation and reduced negative behaviors in children with ASD during dental treatment. Incorporating sensory-adapted environmental modifications, such as ceiling-mounted televisions, may reduce reliance on pharmacologic approaches and support more inclusive, patient-centered pediatric dental care.

## REFERENCES



## ACKNOWLEDGEMENTS

This project was supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number D88HP20126 and titled, "Postdoctoral Training in General, Pediatric and Public Health Dentistry and Dental Hygiene". This information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS, or the U.S. Government. The project was also supported by Nova Southeastern University, College of Dental Medicine # 334744