

# Comparing Virtual Reality and Nitrous Oxide in Pediatric Dentistry

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## Background

- Dental anxiety is a common barrier to dental care
- Virtual Reality (VR) has been researched as a distraction-based technique in dentistry and shown promising results
- Limited literature comparing VR to Nitrous oxide**

## Purpose

- To compare virtual reality and nitrous oxide as distraction modalities to alleviate anxiety and dental pain during dental procedures that require local anesthetic

## Methods

- Population:** selected from one of two pediatric dental clinics at Geisinger Medical Center
- Inclusion Criteria:**
  - Age 5-12 years
  - At least 2 quadrants of restorative work needed
  - F3, F4 behavior
- Exclusion Criteria:**
  - Motion sickness
  - Light/sound hypersensitivity
  - Cannot tolerate headset, N2O, local anesthesia
- Study Design:** crossover, randomized controlled, interventional therapy

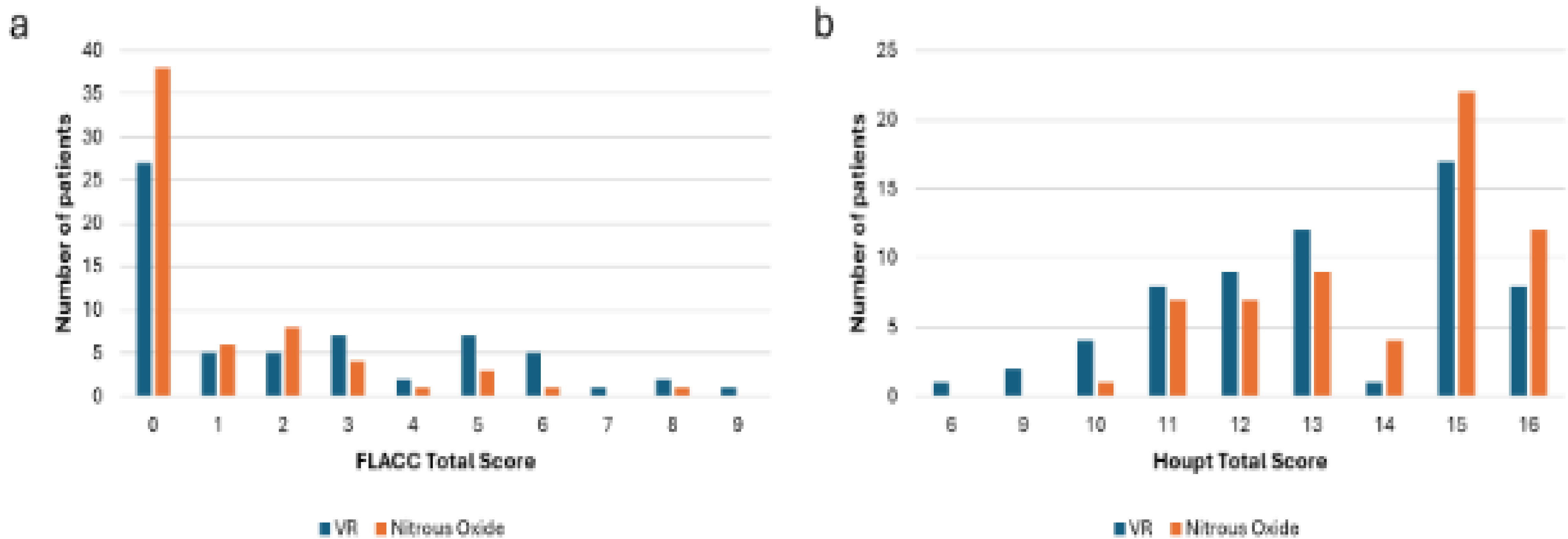
## Results



Figure 1. VR Headset use during dental procedure

Demographics	
Male (%)	39 (63%)
Female (%)	23 (37%)
Age (yr), mean (SD)	9 (3)

Wong-Baker FACES Scale Ratings			
Variable	VR	Nitrous Oxide	P-value
Baseline, n (%) Score 0 Score 2,4,6	55 (88.7%)	54 (87.1%)	0.739
	7 (11.3%)	8 (12.9%)	
End of Treatment, n (%) Score 0 Score 2,4,6,8	46 (74.2%)	53 (85.5%)	0.052
	16 (25.8%)	9 (14.5%)	
FACES Score Change, n (%) No change in pain Worsening Pain	47 (75.8%)	55 (88.7%)	0.021
	15 (24.2%)	7 (11.3%)	



## Discussion

- Statistically significant difference between VR and nitrous oxide group in every measure
- FLACC Scale:** More patients who received nitrous oxide reported no pain in all categories (lower overall median). Lower score equated with less pain
- Houpt Scale:** Higher scores observed more frequently in nitrous oxide group. Higher score equated with less pain.
- Wong-Baker FACES Scale:** More patients reported worsening pain after treatment with VR compared to treatment with nitrous oxide (p = 0.021)

## Conclusion

- Nitrous oxide was more effective than virtual reality as a behavior and pain management tool
- VR may be a viable adjunct to nitrous oxide, but careful case selection is required



Figure 2. Wong-Baker FACES Scale