

Effect of Moderate Sedation Regimen (Diazepam, Meperidine, and Hydroxyzine) Dosages on Patient Behavior and Outcome of Sedation in Pediatric Dentistry: a retrospective study

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Purpose

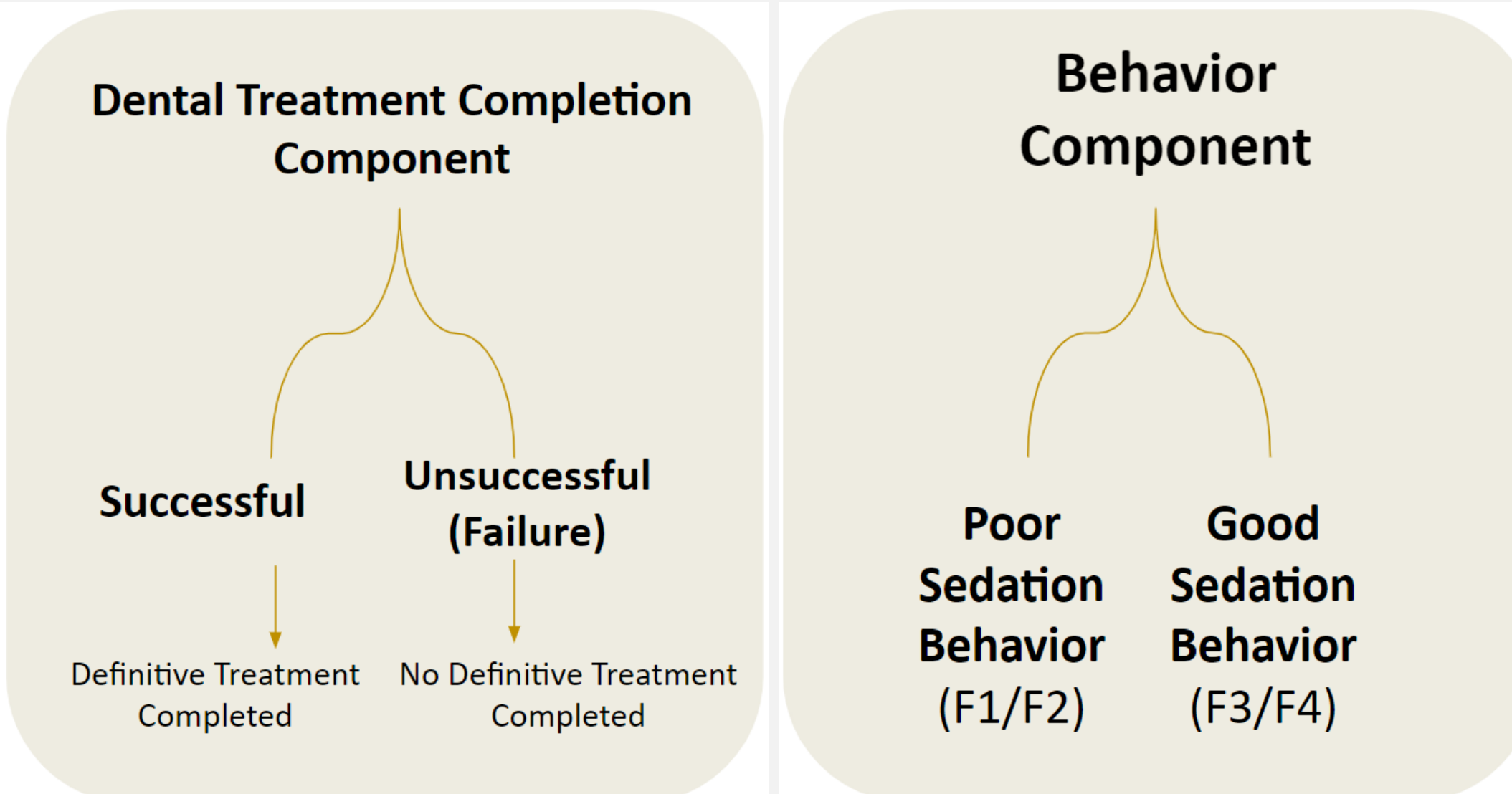
- To assess the overall success of the diazepam, meperidine, and hydroxyzine (DMH) moderate sedation of pediatric patients in the dental setting.
- To examine the effect of patient selection and dose calculations of the medications on the outcome of sedation visits.

Background

- Moderate sedation is an advanced behavior guidance method and is commonly used in pediatric dentistry.¹
- The American Academy of Pediatric Dentistry (AAPD) summarizes indications for sedation as follows; fearful/anxious patients for whom basic behavior guidance techniques have not been successful; patients who cannot cooperate due to a lack of psychological or emotional maturity and/or mental, physical, or medical conditions; and patients for whom the use of sedation may protect the developing psyche and/or reduce medical risk.¹
- Oral sedation is the most commonly used method (93%), and nitrous oxide and benzodiazepines are the most utilized sedation agents.²
- During the last decade, there was a desire for more options to treat pediatric patients in the dental setting without eliciting negative experiences.³
- Studies show increased parental acceptance of moderate sedation.³
- A previous study conducted at VCU Pediatric Dentistry Clinic measured the effectiveness of diazepam, meperidine and hydroxyzine (DMH) combination drug therapy, in comparison to midazolam, meperidine, and hydroxyzine (MMH) sedation regimen. The study showed DMH regimen to be more effective in achieving less failed sedations (30% vs. 55%); although the results did not show statistical significance, they were clinically significant.⁴

Methods

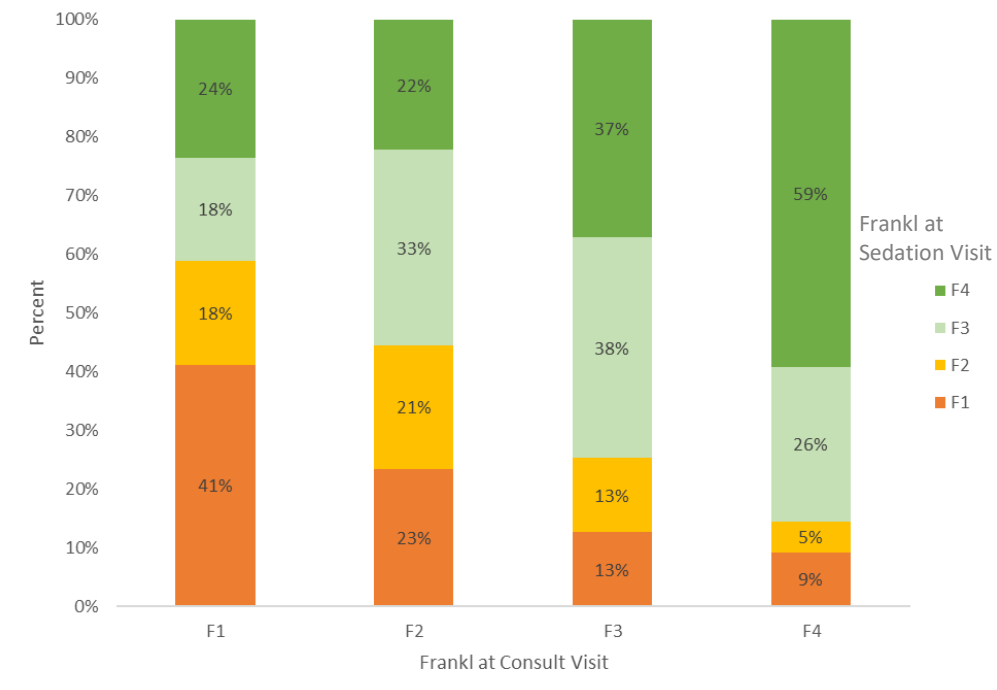
- Study Design:** A retrospective chart review of Virginia Commonwealth University - Department of Pediatric Dentistry Clinic patients who underwent moderate sedation using triple regimen diazepam, meperidine, and hydroxyzine.
- Data was collected from 324 patient charts who underwent 404 sedation visits using the (DMH) moderate sedation regimen at Virginia Commonwealth University - Pediatric Dental Clinic (Richmond, VA, USA) during the period (June 2017-April 2022).
- Variables collected:** gender, age at time of treatment, date of procedure, weight of patient at day of procedure (kg), dosages of medications given (diazepam, meperidine, and hydroxyzine), treatment completed, extraction vs. no extraction, average Frankl scoring for both visits, provider experience (R1 vs. R2), as well as, if aborted treatment turned to a general anesthesia referral.
- Inclusion and exclusion criteria:**
 - All patients who underwent diazepam, meperidine, and hydroxyzine triple regimen sedation at VCU Pediatric Dentistry Department administered by residents with the supervision of fulltime and part time faculty regardless of age and weight were included in the study from April 2017 to June 2022.
 - Any special health care needs that might cause barriers in communication, such as an official medical diagnosis of Autism or developmental delay, as well as data records that had inadequate information were excluded from this study. As this is a retrospective study, ineligible cases and patients who did not meet the moderate sedation criteria were excluded beforehand.
- Assessment of sedation success and behavior:**



Results

- The average age (at first sedation) was 6.8 (SD=2.5) and ranged from 0 to 17. About half (52%, n=170) were female.
- Majority of sedation visits were successful (89%) in allowing completion of all or some definitive treatment.
- Patient behavior: 72% were considered “Good Sedation Behavior” based on the Frankl scores (3 or 4) and 28% were considered “Poor Sedation Behavior.”
- Overall, 10% of sedation visits were referred to general anesthesia.
- Dosage values for the medications in the triple combination were not significantly associated with the sedation visit Frankl scores.
- Higher Frankl scores at consult visits (OR: 0.4, $P=0.01$) and increased age (OR: 0.8, $P=0.01$) were associated with decreased the odds of sedation failure, and increased meperidine dose (OR: 0.9, $P=0.06$) demonstrated a marginally significant association.

Medication	Average Dose
Diazepam	0.28 mg/kg
Meperidine	1.9 mg/kg
Hydroxyzine	1.5 mg/kg



Conclusion

- This study shows that the (DMH) regimen is an effective moderate sedation regimen.
- Patient age and Frankl Score at consult were significantly associated with both sedation success and sedation behavior. These results highlight the importance of patient selection for conscious sedation. Older patients and those with higher Frankl scores at previous dental visits were more likely to have positive outcomes (treatment success and behavior).

References

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