Association between Obesity and Traumatic Dental Injuries in Primary and Permanent Dentition in Children that Visit the Emergency Departments of Children's Hospital and Medical Center and University of Nebraska Medical Center Pediatric Dental Residency Clinic

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INTRODUCTION

- Traumatic dental injuries, TDIs, are injuries to the teeth, periodontium, and surrounding soft tissues.[1]
- It is estimated that between 17-50% of adolescents and adults experience a TDI to at least one permanent tooth their lifetime while 9-40% of children experience a TDI to their primary teeth.[2]
- TDIs most commonly affect the maxillary central incisors in both primary and permanent dentition.[4]
- TDIs are grouped into 3 domains: human behavior, environmental determinants and oral factors.[2,5]
- TDIs can have negative economic, social and psychological impacts for those affected as well as their families.
- Childhood obesity has been labeled a global pandemic
- Prior to the COVID-19 pandemic, obesity affected roughly 20% of children ages 2-19.[3]
- Study of 432,302 children found the rate of BMI increase nearly doubled during the pandemic.[3]

PURPOSE

- While many studies have been conducted on TDIs to permanent teeth and their association with oral risk factors, sex and BMI, very few studies have examined TDIs in the primary dentition in the United States and their association with obesity.[2]
- This study is designed to determine if an association exits between obesity and TDIs (both primary and permanent dentition) using a matched-cohort design.

RESEARCH QUESTION

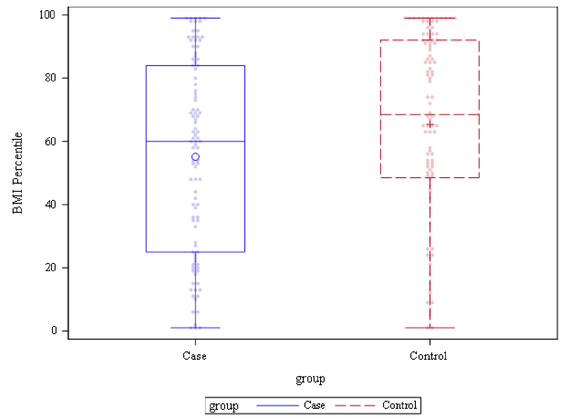
- The aim of this study is to explore the relationship between obesity and TDIs in the primary and permanent dentition.
- The primary research question to be answered: Does BMI significantly differ between patients with a TDI to age/sex/day-matched controls?

METHODS & DATA ANALYSIS

- **Type of Study:** Retrospective
- **Who:** Participants included 100 patients that suffered a TDI; each case was matched to age/sex/day-matched controls
- **Time frame:** August 2015 – April 2020
- **Ages:** 0-18 years old
- **Inclusion criteria:** TDI in a primary or permanent tooth and height/weight acquired within 6 months of TDI
- **Demographic information collected:** Sex and insurance status
- **Other information collected:** Visit date and type of TDI
- All data were collected and organized on Microsoft Excel
- Wilcoxon Rank Sum and Chi-Square tests were used to assess differences between cases and controls for continuous and categorical data, respectively. All analyses were performed using SAS software version 9.4

RESULTS

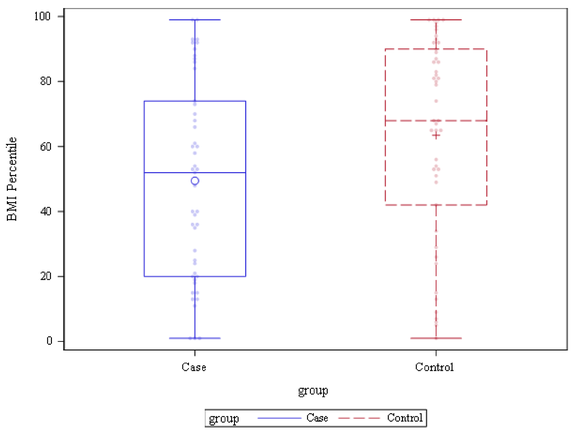
All Cases



	All Cases Case (n=100) n (%)	Control (n = 100) n (%)	P-value
Age in Years(median (IQR))	7 (4, 11)	7 (4, 11)	1.00 †
Gender			1.00 ††
Female	40 (40%)	40 (40%)	
Male	60 (60%)	60 (60%)	
Insurance			0.0003 ††
Medicaid	45 (45%)	73 (73%)	
Private	41 (41%)	21 (21%)	
Self-Pay	14 (14%)	6 (6%)	
BMI (median (IQR))	60 (25, 84)	68.5 (48.5, 92)	0.02 †

†Wilcoxon Rank Sum text.
††Chi Square Test.

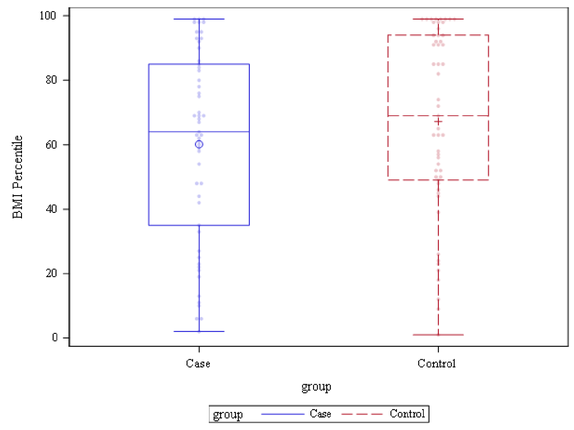
Primary Only



	Primary Only Case (n=47) n (%)	Control (n = 47) n (%)	P-value
Age in Years(median (IQR))	4 (2, 5)	4 (2, 5)	1.00 †
Gender			1.00 ††
Female	21 (44.7%)	21(44.7%)	
Male	26 (55.3%)	26 (55.3%)	
Insurance			< 0.001 ††
Medicaid	17 (36.2%)	38 (80.9%)	
Private	20 (42.6%)	6 (12.8%)	
Self-Pay	10 (21.3%)	3 (6.4%)	
BMI (median (IQR))	52 (20, 74)	68 (42, 90)	0.07 †

†Wilcoxon Rank Sum text.
††Chi Square Test.

Permanent Only



	Permanent Only Case (n=53) n (%)	Control (n = 53) n (%)	P-value
Age in Years(median (IQR))	11 (9, 12)	11 (9, 12)	1.00 †
Gender			1.00 ††
Female	19 (35.9%)	19(35.9%)	
Male	34 (64.2%)	34 (64.2%)	
Insurance			0.73 ††
Medicaid	28 (52.8%)	35 (66.0%)	
Private	21 (39.6%)	15 (28.3%)	
Self-Pay	4 (7.6%)	3 (5.7%)	
BMI (median (IQR))	64 (35, 85)	69 (49, 94)	0.43 †

†Wilcoxon Rank Sum text.
††Chi Square Test.

CONCLUSIONS

- Our study found that patients with TDIs had a significantly lower median BMI percentile relative to age/sex/day-matched controls (p=0.047)
- This may be due in part to higher activity level and thus, more exposure to activities that may lead to a TDI
- There was a significant association between case/control status and insurance (p=> 0.001).
- Confounding factor: Insurance status
- Future studies may want to match on insurance status to help adjust for potential confounding effects.

REFERENCES

1. Antipoviene, A., Narbutaite, J., & Virtanen, J.I. (2021, July). Traumatic dental injuries, treatment, and complications in children and adolescents: A register-based study. *European Journal of Dentistry*. Retrieved October 22, 2022, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8382465/
2. Born, C.D., Jackson, T.H., Koroluk, L.D., & Divaris, K. (2019). Traumatic Dental Injuries in Preschool-age Children: Prevalence and Risk Factors. Clinical and Experimental Dental Research, 5(2), 151159. https://doi.org/10.1002/cre2.165
3. Centers for Disease Control and Prevention. (2022, May 17). *Childhood obesity facts.* Centers for Disease Control and Prevention. Retrieved October 20, 2022, from https://www.cdc.gov/obesity/data/childhood.html
4. Dua, R., & Sharma, S. (2012, January). *Prevalence, Causes, and Correlates of Traumatic Dental Injuries Among Seven-to-Twelve-Year-Old School Children in Dera Bassi.* Contemporary clinical dentistry. Retrieved October 22, 2022, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3341757
5. Glendor, U. (2009). Aetiology and Risk Factors Related to Traumatic Dental Injuries – A Review of the Literature. *Dental Traumatology,* 25(1), 1931. https:doi.org/10.1111/j.1600-9657.2008.00694.x