

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**

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

Eric Wood, DMD• Zachary Houser, DMD• Kaeli Samson, MA, MPH University of Nebraska Medical Center • Children's Hospital and Medical Center



ΓS				
es				
				CONCLUSIONS
	Case	Control		
	(n=100)	(n = 100)		 Our study found that patients with
	n (%)	n (%)	P-value	TDIs had a significantly lower
Age in Years(median (IQR)) Gender	7 (4, 11)	7 (4, 11)	1.00 ⁺ 1.00 ⁺⁺	median BMI percentile relative to
Female	40 (40%)	40 (40%)		age/sex/day-matched controls
Male	60 (60%)	60 (60%)		(p=0.047)
Insurance			0.0003 **	 This may be due in part to higher
Medicaid	45 (45%)	73 (73%)		activity level and thus, more
Private	41 (41%)	21 (21%)		exposure to activities that may lead
Self-Pay	14 (14%)	6 (6%)	0.00 +	to a TDI
t Mileeven Benk Sum text	60 (25, 84) 6	58.5 (48.5, 92)	0.02 '	
⁺ Chi Square Test.				 There was a significant association between case/control status and insurance (p=> 0.001)
				$O = f_{a} = f_{a} = f_{a} = f_{a} = f_{a} = f_{a}$
				Contounding factor: Insurance
)nlv				Sialus
· · · · J				 Future studies may want to match
	Primar	y Only		on insurance status to help adjust
	Case	Control		for potential confounding effects.
	(n=47)	(n = 47)	_ ·	
	n (%)	n (%)	P-value	
Age in Years(median (IQR))	4 (2, 5)	4 (2, 5)	1.00 ⁺	
Fomalo	21(1170)	21(11, 70)	1.00 ''	
Male	26 (55 3%)	26 (55 3%)		
Insurance	20 (00.070)	20 (00.070)	< 0.001 ⁺⁺	REFERENCES
Medicaid	17 (36.2%)	38 (80.9%)		
Private	20 (42.6%)	6 (12.8%)		1. Antipoviene, A., Narbutaite, J., & Virtanen, J.I.
Self-Pay	10 (21.3%)	3 (6.4%)		treatment, and complications in children and
BMI (median (IQR))	52 (20, 74)	68 (42, 90)	0.07 +	adolescents: A register-based study. European
[†] Wilcoxon Rank Sum text.				Journal of Dentistry. Retrieved October 22,
TChi Square Test.				2022, from https://www.pcbi.plm.pib.gov/pmc/articlos/PMC
				8382465/
				2. Born, C.D., Jackson, T.H., Koroluk, L.D., &
				Divaris, K. (2019). Traumatic Dental Injuries in
				Preschool-age Children: Prevalence and Risk
Only				Factors. Clinical and Experimental Dental
	Dormon	ont Only		Kesearcn, 5(2), 151159. https://doi.org/10.1002/crp2.165
	Case	Control		3. Centers for Disease Control and Prevention.
	(n=53)	(n = 53)		(2022, May 17). Childhood obesity facts.
	n (%)	n (%)	P-value	Centers for Disease Control and Prevention.
Age in Years(median (IQR)) Gender	11 (9, 12)	11 (9, 12)	1.00 [†] 1.00 ^{††}	Retrieved October 20, 2022, from https://www.cdc.gov/obesity/data/childhood.htm
Female	19 (35.9%)	19(35.9%)		$\begin{bmatrix} 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 2 \\ 2 \end{bmatrix} \begin{bmatrix} $
Male	34 (64.2%)	34 (64.2%)		Prevalence, Causes, and Correlates of
Insurance			0.73 ⁺⁺	Traumatic Dental Injuries Among Seven-to-
Medicaid	28 (52.8%)	35 (66.0%)		Twelve-Year-Old School Children in Dera
Private	21 (39.6%)	15 (28.3%)		Bassi. Contemporary clinical dentistry.
Self-Pay	4 (7.6%)	3 (5.7%)	• • • •	Ketrieved October 22, 2022, from
BMI (median (IQR))	64 (35, 85)	69 (49, 94)	0.43 †	3341757
TWilcoxon Rank Sum text.				5. Glendor, U. (2009). Aetiology and Risk Factors
uoni square lest.				Related to Traumatic Dental Injuries – A
				Review of the Literature. Dental Traumatology,
				25(1), 1931. https://doi.org/10.1111/j.1600-
				9001.2008.00094.X

ť	П	1		

All Cas	es				
		All Ca	ISES		CONCLUSIONS
		Case	Control		
	Age in Years(median (IQR))	(n=100) n (%) 7 (4, 11)	(n = 100) n (%) 7 (4, 11)	P-value 1.00 [†]	 Our study found that patients with TDIs had a significantly lower modian BML percentile relative to
	Gender			1.00 ++	ago/sov/day_matched controls
	Female	40 (40%)	40 (40%)		(n=0.017)
	Insurance	60 (60%)	60 (60%)	0 0003 ++	(p=0.0+7)
	Medicaid	45 (45%)	73 (73%)	010000	• This may be due in part to higher
	Private	41 (41%)	21 (21%)		activity level and thus, more
	Self-Pay	14 (14%)	6 (6%)		exposure to activities that may lead
	BMI (median (IQR))	60 (25, 84) 6	\$8.5 (48.5, 92)	0.02 †	to a I DI
	[†] Wilcoxon Rank Sum text. ^{††} Chi Square Test.				 There was a significant association between case/control status and incurrence (n > 0.001)
					 Insurance (p=> 0.001). Confounding factor: Insurance
Primary (Dnlv				รเลเนร
	J				 Future studies may want to match
		Primary	y Only		on insurance status to help adjust
		Case	Control $(n - 47)$		for potential confounding effects.
		(n=47) n (%)	(n = 47) n (%)	P-value	
	Age in Years(median (IQR)) Gender	4 (2, 5)	4 (2, 5)	1.00 [†] 1.00 ^{††}	
	Female	21 (44.7%)	21(44.7%)		
	Male	26 (55.3%)	26 (55.3%)		REFERENCES
	Insurance			< 0.001 TT	
	Medicald Drivato	17 (30.2%)	38 (80.9%) 6 (12.8%)		1. Antipoviene, A., Narbutaite, J., & Virtanen, J.I.
	Self-Pav	20 (42.0%)	3 (6 4%)		(2021, July). Traumatic dental injuries,
	BMI (median (IQR))	52 (20, 74)	68 (42, 90)	0.07 +	adolescents: A register-based study. <i>Europear</i>
	[†] Wilcoxon Rank Sum text. ^{††} Chi Square Test.				Journal of Dentistry. Retrieved October 22, 2022, from
					 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC 8382465/ 2. Born, C.D., Jackson, T.H., Koroluk, L.D., & Divaris, K. (2019). Traumatic Dental Injuries in Preschool-age Children: Prevalence and Risk
ermanent	Only				Factors. Clinical and Experimental Dental
		Permane	ent Only		https://doi.org/10.1002/cre2.165
		Case	Control		3. Centers for Disease Control and Prevention.
		(n=53)	(n = 53)	_	(2022, May 17). Childhood obesity facts.
		n (%)	n (%)	P-value	Retrieved October 20, 2022, from
	Age in Years(median (IQR)) Gender	11 (9, 12)	11 (9, 12)	1.00 ⁺ 1.00 ⁺⁺	https://www.cdc.gov/obesity/data/childhood.htm I
	Ecmala	10 /25 00/)	I 3(30.9%)		
	Female Male	19 (35.9%) 34 (64 2%)	34 (64 2%)		4. Dua, R., & Snarma, S. (2012, January).
	Female Male Insurance	19 (35.9%) 34 (64.2%)	34 (64.2%)	0.73 ++	4. Dua, R., & Snarma, S. (2012, January). Prevalence, Causes, and Correlates of Traumatic Dental Injuries Among Sovies to
	Female Male Insurance Medicaid	19 (35.9%) 34 (64.2%) 28 (52.8%)	34 (64.2%) 35 (66.0%)	0.73 ++	4. Dua, R., & Snarma, S. (2012, January). Prevalence, Causes, and Correlates of Traumatic Dental Injuries Among Seven-to- Twelve-Year-Old School Children in Dera
	Female Male Insurance Medicaid Private	19 (35.9%) 34 (64.2%) 28 (52.8%) 21 (39.6%)	34 (64.2%) 35 (66.0%) 15 (28.3%)	0.73 ++	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.
	Female Male Insurance Medicaid Private Self-Pay	19 (35.9%) 34 (64.2%) 28 (52.8%) 21 (39.6%) 4 (7.6%)	34 (64.2%) 35 (66.0%) 15 (28.3%) 3 (5.7%)	0.73 ++	4. Dua, R., & Snarma, 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
	Female Male Insurance Medicaid Private Self-Pay BMI (median (IQR))	19 (35.9%) 34 (64.2%) 28 (52.8%) 21 (39.6%) 4 (7.6%) 64 (35, 85)	34 (64.2%) 35 (66.0%) 15 (28.3%) 3 (5.7%) 69 (49, 94)	0.73 ⁺⁺	 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/PMC 3341757
	Female Male Insurance Medicaid Private Self-Pay BMI (median (IQR)) [†] Wilcoxon Rank Sum text.	19 (35.9%) 34 (64.2%) 28 (52.8%) 21 (39.6%) 4 (7.6%) 64 (35, 85)	34 (64.2%) 35 (66.0%) 15 (28.3%) 3 (5.7%) 69 (49, 94)	0.73 ⁺⁺	 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/PMC 3341757 Glendor, U. (2009). Aetiology and Risk Factors
	Female Male Male Insurance Medicaid Private Self-Pay BMI (median (IQR)) [†] Wilcoxon Rank Sum text. [†] Chi Square Test.	19 (35.9%) 34 (64.2%) 28 (52.8%) 21 (39.6%) 4 (7.6%) 64 (35, 85)	34 (64.2%) 35 (66.0%) 15 (28.3%) 3 (5.7%) 69 (49, 94)	0.73 ⁺⁺	 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/PMC 3341757 Glendor, U. (2009). Aetiology and Risk Factors Related to Traumatic Dental Injuries – A

