

# Navigating Dental Trauma In Children Aged 3-14 Years In Rural India: Insights Into Age, Gender, And Socioeconomic Disparities, A Cross Sectional Study

## Abstract:

**Objective:** This study investigates the correlation between economic circumstances and social position and the occurrence of anterior teeth trauma in children, aiming to understand treatment patterns across different income brackets. The sample size comprised 1564 children with documented anterior teeth trauma, categorized by monthly earnings observed in the B.G Prasad scale, which primarily categorizes the Indian Income Group, especially in rural areas.

**Methodology:** This research took place in close proximity to Jaipur, Rajasthan, India. It encompassed a group of 1564 school-aged children ranging from 3 to 14 years old. The approach involved gathering data on trauma occurrence and treatment status, stratified by B G Prasad socioeconomic status (SES), followed by statistical examination to identify correlations.

**Results:** Indicates a significant correlation between SES and treatment received for anterior teeth trauma, with lower-income brackets showing reduced access to treatment compared to higher-income groups, with a p-value of 0.00011, indicating significant high values.

**Conclusions:** Notably, children from low earning households were less likely to receive treatment, highlighting disparities in healthcare access based on socio-economic factors. This study emphasizes the importance of addressing socio-economic disparities in healthcare provision, particularly concerning trauma management in children.

**Key-words:** Socioeconomic status, Treatment disparity, Gender difference. MeSHkeywords : Dental trauma, oral health, Dental care access.

## Introduction:

In children, orofacial trauma stands out as a significant concern within oral health. Just like the focus on preventing caries and periodontal disease, there's been an increasing emphasis on dental public health efforts aimed at preventing and promoting care for traumatic dental injuries among children.[1]

In recent decades, there has been a notable surge in research articles focusing on dental injury amidst the adolescent cohort. This trend suggests that traumatic oral injury has increasingly become a major health concern. Research indicates that approximately one in five children in industrialized nations experiences a Traumatic dental injury affecting permanent teeth before completing their schooling. Understanding the factors linked to dental trauma is crucial for developing effective strategies to mitigate its impact.[2]

The BG Prasad scale (Table 1), initially developed in 1961 and subsequently revised by Prasad himself in 1968 and 1970, provides valuable guidance for researchers in determining specific income categories for their studies in the current calendar year.[6]

<sup>1</sup>CHAYA CHHABRA, <sup>2</sup>ABONISH PAUL, <sup>3</sup>ROOPALI NATH MATHUR, <sup>4</sup>GAURAV CHHABRA

<sup>1,2</sup>Department of Pediatric and Preventive Dentistry, NIMS Dental College and Hospital, NIMS University, Jaipur

<sup>3</sup>Department of Community Medicine NIMS&R, Jaipur,

<sup>4</sup>Department of Public Health Dentistry, NIMS Dental College and Hospital, NIMS University, Jaipur

**Address for Correspondence:** Dr Chaya Chhabra  
Professor and HOD

Department of Pediatric and Preventive Dentistry  
NIMS Dental College and Hospital,  
NIMS University, Jaipur, India  
Email: chaya.chhabra@gmail.com

**Received :** 14 Aug., 2024, **Published :** 31 March, 2025

**How to cite this article:** Chhabra, C., Paul, A., Nath Mathur, R., & Chhabra, K. (2025). Navigating Dental Trauma In Children Aged 3-14 Years In Rural India. UNIVERSITY JOURNAL OF DENTAL SCIENCES, 11(1).

## Access this article online

**Website:**  
[www.ujds.in](http://www.ujds.in)

**DOI:**  
<https://doi.org/10.21276/ujds.2025.11.1.23>

## Quick Response Code



Among Indians, socioeconomic status (SES) is typically assessed using BG Prasad's scale for urban and rural areas. These scales provide frameworks for determining socioeconomic status based on various indicators relevant to each setting.[7]

The Ministry of Labor Bureau recently implemented an amendment, shifting the base year to 2016 through the introduction of a linking factor of 2.88. This adjustment was made with the primary goal of producing updated compilation of Consumer Price Indices for Industrial Workers is available, both for the entire country and for individual centres., reflecting the most current consumption patterns of the working-class population.<sup>8</sup> In a similar manner, The Kuppuswamy Scale is a socio-economic classification system used in India. B G Prasad scale takes into account various parameters such as education, occupation, and income to classify households into different categories which is also a widely used scale in India.[1]

Epidemiological data reveals a considerable disparity in terms of dental injuries among children. Injuries to primary (deciduous) teeth can lead to complications for the permanent teeth beneath, including issues like hypoplasia, discoloration, delayed eruption, and tooth malformation. Traumatic dental injuries represent genuine dental emergencies, necessitating prompt assessment and management. The correlation with socioeconomic status for treatment is a significant factor contributing to children not receiving appropriate care.[3,4]

### Methodology :

The current study was conducted at the Department of Paediatrics and Preventive Dentistry, NIMS Dental College and Hospital, Jaipur, Rajasthan, with ethical approval from the Institutional Ethical Clearance Committee. A total of 1,564 school-going children, aged 3 to 14 years, participated in the study. Procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975. Using a simple random sampling method, children from diverse genders, socioeconomic backgrounds, and geographical locations within the city were randomly selected and categorized.

A solitary qualified investigator, accompanied by a proficient and attentive assistant, conducted the study. Prior to the survey, the assistant engaged in a comprehensive discussion and clinical assessment regarding the examination protocol to ensure consistency and minimize intra-oral examination discrepancies. The children underwent examinations while seated on standard chairs, positioned facing the window to

optimize natural illumination for oral inspection, supplemented by the use of a diagnostic instruments. In instances of inadequate lighting, a torch was employed.

Dental examinations were carried out by trained dental professionals following standardized protocols to ensure consistency and accuracy. The data collected included various parameters: Age was categorized into three distinct groups—Group I (3 to 5 years), Group II (6 to 10 years), and Group III (11 to 14 years). Gender was recorded as either male or female and overjet were recorded. Socioeconomic status was assessed using the B G Prasad scale (2021), which categorizes individuals into different socioeconomic classes based on family income and occupation. This comprehensive approach ensured a thorough assessment of various factors influencing dental health and trauma.

### Statistical analysis:

Statistical analysis was done with Statistical Package for Social Sciences (IBM SPSS Statistic for window, version 21.0. Armonk, NY: IBM Corp.) at 95% CI and 80% power to the study. Descriptive statistics was performed in terms of mean, standard deviation and frequency and percentage. Chi square test was applied to check significant association of socioeconomic status and treatment done of trauma.

Statistical significance was kept at  $p < 0.05$ .

### Results:

Age	No. of children	Number of teeth with trauma (%)	Level of significance (p value)	Percentage
3-5 years	391	44 (11.2%)	$\chi^2 = 15.19$ $p = 0.0017$ significant	25
6-10 years	938	122 (13%)		59.74
11-14 years	235	42 (17.8%)		15.02
<b>Total</b>	1564	208 (13.2%)		100

**Table 2**

Dental trauma in children increases with age. As shown in Table 2, 11.2% of teeth are affected in the 3-5 years group, rising to 13% in the 6-10 years group, and reaching 17.8% in the 11-14 years group, statistically being significant ( $p = 0.0017$ ). While the 6-10 years group has the highest number of trauma cases (59.74% of the total), the 11-14 years group shows a higher proportion of trauma per child, indicating that older children are more prone to dental trauma.

Gender	No. of children	No. of children with trauma (%)	Level of significance (p value)	Percentage
Females	885	116 (13.1%)	$\chi^2 = 0.173$ $p = 0.677$ non-significant	56.58
Males	679	92 (13.5%)		43.41
<b>Total</b>	1564	208 (13.2%)		100

**Table 3**

The data reveals that dental trauma affects 13.2% of children overall, with 13.1% of females and 13.5% of males experiencing trauma as recorded. Despite this slight difference, as shown in Table 3, the level of significance ( $\chi^2 = 0.173$ ,  $p = 0.677$ ) indicates that the gender difference is not statistically significant. Females account for 56.58% of total trauma cases, while males represent 43.41%

	INR(Indian rupees)	Non Treated	Treated		Total
SOCIO ECONOMIC STATUS	>7770 . n=625	10 (45.4%)	12	$\chi^2=58.796$ p value=0.0001 significant	22
	3808-7769. N=312	68 (91.8%)	6		74
	2359-3930. N=304	80 (97.5%)	2		82
	1179-2358 n=197	26 (100%)	0		26
	<1179. N=126	4 (100%)	0		4
	Total=1564	188 (90.3%)	20		208

**Table 4**

The data in Table 4 shows a clear relationship between socioeconomic status and the likelihood of receiving dental treatment. Among children from higher socioeconomic backgrounds (income > ₹7770), only 45.4% of those with dental trauma were untreated, while in lower-income groups, the percentage of untreated cases rises significantly. For instance, in the ₹3808-₹7769 group, 91.8% were untreated, and this trend continues, with 100% of trauma cases in the lowest income brackets (< ₹2358) being untreated. The overall trend is statistically significant ( $\chi^2 = 58.796$ ,  $p = 0.0001$ ), indicating that children from lower socioeconomic backgrounds are less likely to receive treatment for dental trauma.

**Table 5**

			Total
Overjet	>3mm	580	62 (10.6%)
	<3mm	984	146 (14.8%)
	Total	1564	208

In the total number of individuals, 10.6% with an overjet >3mm had notable cases, compared to 14.8% with an overjet <3mm indicating that increase in overjet had not much to do with increased cases of anterior tooth fracture as seen in Table 5.

## Discussion:

The distribution of participants based on age provides significant insights into the prevalence of dental trauma among different age groups. In our study, a total of 1564 children were examined, revealing varying rates of dental trauma across different age brackets. Among children aged 3-5 years, 11.2% experienced dental trauma out of 391 children,

with a statistically significant association indicated by a  $\chi^2$  value of 15.19 and a p-value of 0.0017. Similarly, in the 6-10 age group, 13% of 938 children experienced dental trauma. However, the highest prevalence was observed among children aged 11-14 years, where 17.8% of 235 children had dental trauma. These findings align with previous studies by Gupta *et al.* and Baldavaet *al.*, which reported similar prevalence rates. The  $\chi^2$  values and associated p-values emphasize the significance of these associations.[5,10]

In contrast to our study, other research such as Marceneset *al.* and Adekoya-Sofoworaet *al.* reported higher prevalence rates of dental trauma, indicating the importance of age as a factor in dental trauma occurrence, with older children exhibiting a higher prevalence.<sup>11,12</sup> The table also highlights distribution based on gender, revealing that females experienced dental trauma at a rate of 13.1% out of 885, while among males, the rate was slightly higher at 13.5% out of 679 males. However, statistical analysis shows a non-significant association value of 0.677 between gender and dental trauma, suggesting that the difference in trauma rates between genders is not statistically significant within this sample. Despite slight variations in trauma rates between males and females, the overall prevalence of dental trauma remains consistent at 13.2% across both genders. Marceneset *al.* reported a similar even distribution between sexes, contrary to studies by Garcia-Godoy *et al.* and Stockwell *et al.*, who reported higher incidence of trauma among girls.[13,14]

Out of 580 participants in our study with an overjet greater than 3 mm, 62 cases (10.6%) were observed having anterior teeth trauma. Conversely, among 984 individuals with an overjet less than 3 mm, 146 cases (14.8%) were recorded with anterior tooth trauma. This indicates that anterior teeth trauma simultaneously affect both sets of children, with or without overjet.

Our study explores the relationship between socioeconomic status and the likelihood of receiving treatment for dental trauma. Socioeconomic status was assessed using the B G Prasad socioeconomic updated scale (2021), which categorizes income levels into various brackets. The data clearly demonstrates a strong correlation between income levels and the probability of receiving treatment for anterior teeth trauma. Specifically, children from higher-income backgrounds (those earning more than ₹7770 per month) are significantly more likely to receive treatment compared to those from lower-income groups. In contrast, children from lower-income households face substantial barriers to accessing dental care.

Statistical analysis supports this finding, revealing a highly significant association between monthly earnings and the likelihood of receiving treatment, with a p-value of 0.0001. This result underscores that as income levels rise, so does the likelihood of receiving timely and appropriate dental care. Children from lower-income brackets show a markedly higher percentage of untreated cases, indicating a gap in access to necessary dental treatment. This disparity highlights the broader issue of healthcare inequality, where economic constraints limit access to essential services.

Furthermore, the findings suggest that the treatment gap may be exacerbated by additional factors such as lack of awareness, availability of dental services, and logistical challenges in accessing care. These barriers not only affect the immediate health outcomes for children but also have long-term implications for their overall well-being and development. Addressing these issues requires targeted interventions and policies that aim to improve access to dental care for underserved populations, ensuring that socioeconomic factors do not hinder the quality of treatment received. By focusing on these disparities, we can work towards a more equitable healthcare system that provides all children with the necessary care to maintain their dental health. Systemic inequalities in healthcare access, emphasizing the need for targeted interventions to address disparities and ensure equitable healthcare provision for all socioeconomic groups. Hamilton *et al.* and Alonge *et al.* noted similar trends, highlighting the importance of addressing socioeconomic disparities in accessing dental care and ensuring equitable access to treatment for all individuals. [15,16]

## Conclusion:

The examination of the provided data yields valuable insights into the occurrence and spread of dental injuries across diverse demographic and socioeconomic parameters. The results uncover variations in injury prevalence concerning factors such as age, gender, socioeconomic status, and school setting. While older children tend to have higher injury rates, gender disparities are not pronounced. Furthermore, socioeconomic status emerges as a key influencer affecting both injury occurrence and access to treatment, with lower socioeconomic groups experiencing elevated injury rates but also receiving more treatment.

## References:

1. Khandelwal V, Nayak UA, Nayak PA, Ninawe N. Prevalence of traumatic injuries to the anterior teeth among 3–17-year-old school children of Indore and correlating it with Kuppaswamy SES, occlusal relationship and ascertaining percentage of those seeking the treatment. *International Journal of Adolescent Medicine and Health*. 2018 Nov 6;33(1):20180061.
2. David J, Åström AN, Wang NJ. Factors associated with traumatic dental injuries among 12-year-old schoolchildren in South India. *Dental traumatology*. 2009 Oct;25(5):500-5.
3. Chalissery VP, Marwah N, Jafer M, Chalisserry EP, Bhatt T, Anil S. Prevalence of anterior dental trauma and its associated factors among children aged 3-5 years in Jaipur City, India—A cross sectional study. *Journal of International Society of Preventive & Community Dentistry*. 2016 Apr;6(Suppl 1):S35.
4. Gojanur S, Yeluri R, Munshi AK. Prevalence and etiology of traumatic injuries to the anterior teeth among 5 to 8 years old school children in Mathura city, India: An epidemiological study. *International journal of clinical pediatric dentistry*. 2015 Sep;8(3):172.
5. Gupta M, Upadhyaya P, Parihar AS, Singh P, Khare Y, Bathija P. Prevalence, risk factors and treatment needs of traumatic dental injuries to anterior teeth among 6-15 year old schoolchildren. *Int J Curr Med Pharm Res*. 2018;4(2):2958-63.
6. Pandey VK, Aggarwal P, Kakkar R. Modified BG Prasad socio-economic classification, update-2019. *Indian journal of community health*. 2019 Mar 31;31(1):150-2.
7. Shaikh Z, Pathak R. Revised Kuppaswamy and BG Prasad socio-economic scales for 2016. *Int J Community Med Public Health*. 2017 Apr;4(4):997-9.
8. Khairnar MR, Kumar PN, Kusumakar A. Updated BG prasad socioeconomic status classification for the year 2021. *Journal of Indian Association of Public Health Dentistry*. 2021 Apr 1;19(2):154-5.
9. Ain TS, Telgi RL, Sultan S, Tangade P, Telgi CR, Tirth A, Pal SK, Gowhar O, Tandon V. Prevalence of traumatic dental injuries to anterior teeth of 12-year-old school children in Kashmir, India. *Archives of trauma research*. 2016 Mar;5(1).
10. Baldava P, Anup N. Risk factors for traumatic dental injuries in an adolescent male population in India. *J Contemp Dent Pract*. 2007 Sep 1;8(6):35-42.
11. Marcenes W, Alessi ON, Traebert J. Causes and prevalence of traumatic injuries to the permanent incisors of school children aged 12 years in Jaragua do Sul, Brazil. *International dental journal*. 2000 Apr;50(2):87-92.
12. Oginni AO, Adekoya-Sofowora CA. Pulpal sequelae after trauma to anterior teeth among adult Nigerian dental patients. *BMC Oral Health*. 2007 Dec;7(1):1-5.

13. Garcia-Godoy F, Garcia-Godoy F, Garcia-Godoy F M .  
Primary teeth traumatic injuries at a private  
pediatric dental center. *Dental Traumatology*. 1987  
Jun;3(3):126-9.
14. Stockwell AJ. Incidence of dental trauma in the Western  
Australian school dental service. *Community dentistry  
and oral epidemiology*. 1988 Oct;16(5):294-8.
15. Hamilton FA. An investigation into treatment services  
for traumatic injuries of the teeth of adolescents. The  
University of Manchester (United Kingdom); 1994.
16. Alonge OK, Narendran S, Williamson DD. Prevalence  
of fractured incisal teeth among children in Harris  
County, Texas. *Dental traumatology*. 2001  
Aug;17(5):214-7.
17. Hunter ML, Hunter B, Kingdon A, Addy M, Dummer  
PM, Shaw WC. Traumatic injury to maxillary incisor  
teeth in a group of South Wales school children. *Dental  
Traumatology*. 1990 Dec;6(6):260-4.