



PREVALENCE OF DENTAL CARIES, TRAUMATIC DENTAL INJURIES AND UNMET RESTORATIVE TREATMENT NEEDS AMONG SCHOOL CHILDREN OF UDUPI CITY

NITYA CHHABRA¹, ISHA SINGH¹, SAURAV BHADURI¹ AND KALYANA CHAKRAVARTHY PENTAPATI^{1*}

¹Department of Public Health Dentistry, Manipal College of Dental Sciences, Manipal University, Manipal.

ABSTRACT

Aim: We aimed to evaluate the dental caries, traumatic dental injuries (TDI) and unmet restorative treatment needs (URTN) among the school children of Udupi district and to compare these parameters between public and private school children. **Materials and methods:** A cross-sectional study was done among 9-15 year old school children of 4 government and 4 private schools of Udupi district. Demographic information like age, gender, type of school along with caries status and traumatic dental injuries were recorded. All clinical examinations were evaluated in school premises under natural lighting conditions using mouth mirrors and CPI probes as per WHO guidelines (1997). **Results:** A total of 792 school children were examined out of which 50.8% were males. A total of 24.2% (n=292) and 47.9% (n=279) children had caries in primary and permanent dentition with mean of 0.42±0.88 and 1.13±1.5 respectively. A total of 6% of the subjects had TDI (5.4% in enamel and 0.6% in dentin fracture). Absolute number of teeth with unmet treatment needs for restorations, prosthesis and extractions were 1290, 4 and 15 respectively. The mean decayed teeth in permanent and primary dentition was significantly higher in public school children than private school children (p=0.001 and 0.001) respectively. The restorative need calculated from decayed teeth and traumatic dental injuries was significantly higher than the restorative need calculated from decayed teeth only (p<0.001). **Conclusion:** Almost half of the school children had caries experience in the permanent dentition. Traumatic dental injuries constitute significant proportion of restorative need and should be included in the assessment of unmet restorative need.

KEYWORDS: Caries, dental trauma, restorative need, unmet



KALYANA CHAKRAVARTHY PENTAPATI

Department of Public Health Dentistry, Manipal College of Dental Sciences,
Manipal University, Manipal.

INTRODUCTION

Dental caries is the common disease among children followed by periodontal diseases for which plaque is considered the etiological factor. Teeth would be at risk of caries soon after the eruption in the oral cavity and will be at risk throughout. Both primary and permanent dentitions are at equal risk of having caries. Plaque control, restricted consumption of sweetened foods, topical fluoride application and pit and fissure sealants are few preventive strategies that can be recommended for the prevention of dental caries. Previous studies in India reported varied prevalence's that ranged from 17% (Malvania et al., 2014)¹; 30.5% (Sohi et al., 2012)²; 42.4% (Das et al., 2013)³; 52% (Grewal et al., 2011)⁴; 63% (Dhar et al., 2009)⁵; 64% (Meghashyam et al., 2007)⁶; 65.7% (Kalaskar et al., 2015)⁷; to 66% (Dash et al., 2002).⁸ Traumatic dental injuries (TDI) are also common among the children which are due to sports related injuries. Chipped teeth account for the majority of the dental injuries, however, luxated or avulsed teeth are also not uncommon, which account for a significant amount of restorative need. Previous studies in India reported prevalence rates from 5% (Kaur et al., 2014)⁹; 9% (Patel and Sujana, 2012)¹⁰; 14.5% (Dua and Sharma, 2012)¹¹ to 15% (Batra et al., 2014).¹² Previous studies on unmet restorative treatment needs among children have evaluated the unmet restorative treatment need (URTN) based on the decayed teeth or with complex Dentition status and treatment need form given by WHO (Dash JK, 2002)⁸ while, the need for restorative treatment need is accounted by decayed teeth and traumatic dental needs especially in children. Hence, such studies which evaluated the restorative unmet treatment needs with decayed teeth into consideration might often under report the actual need. With this background, we aimed to evaluate the dental caries, traumatic dental injuries and unmet restorative treatment needs (URTN) among the school children of Udupi district. We also aimed to compare these parameters between public and private school children.

MATERIAL AND METHODS

A cross-sectional study was done among 9-15 year old school children of 4 government and 4 private schools of Udupi district. A total of 735 school children were needed to be surveyed, which was calculated based on the caries prevalence of the pilot study (15%) with a 95% level of confidence, with design effect of 1.5 and 80% response rate. Stratified cluster sampling was done to select the children. Demographic information like age, gender, type of school along with caries status and traumatic dental injuries were recorded. Dental caries was recorded using deft (decayed, extracted filled teeth) and DMFT (Decayed, Missing, Filled Teeth) in primary and permanent dentition. Traumatic dental injuries were recorded using Ellis and Davey's

classification for traumatic dental injuries. All clinical examinations were evaluated by two examiners in school premises under natural lighting conditions using mouth mirrors and CPI probes as per WHO guidelines (1997).¹³ Unmet restorative treatment needs was assessed by the counting the number of restorations needed. The need for restorations due to caries and trauma were all included as restorative need. Informed consent was sought from the parents before conducting the survey and prior institutional ethics committee approval was obtained (349/2015). All the children who were present on the day of examination and who were willing to participate were included in the study. Children with chronic systemic illnesses or any syndromes, those who were undergoing orthodontic treatment were excluded. Training and calibration exercises were done in the department of public health dentistry 2 weeks prior to the main survey of 30 school children. Kappa statistics for intra and inter examiner showed a high degree of reproducibility for dental caries and TDI. All the analysis was done using SPSS version 18. A p-value of <0.05 was considered statistically significant. Mann-Whitney test was used to compare the mean scores of DMFT, deft and TDI. Wilcoxon signed rank test was used to compare restorative need with decayed teeth only and decayed teeth in combination with traumatic dental injuries.

RESULTS

A total of 792 school children were examined out of which 50.8% were males. A total of 24.2% (n=292) and 47.9% (n=279) children had decay in primary (dt) and permanent dentition (DT) with a mean 0.42 ± 0.88 and 1.13 ± 1.5 respectively. Only 0.5% (n=4) had missing teeth (MT) in permanent dentition and 1.7% (n=13) children had deciduous teeth indicated for extraction (et). Filled teeth in permanent (FT) and primary teeth (ft) were present in 3.9% (n=31) and 7.7% (n=61) school children respectively. A total of 6% of the subjects had TDI (5.4% in enamel and 0.6% in dentin fracture). The absolute number of teeth with UTRN for restorations, prosthesis and extractions were 1290, 4 and 15 respectively. Out of the total 1290 restorations, the contributions of dt, DT and TDI were 69.92, 25.96 and 4.11%. No significant differences were seen in the mean dt and DT between males and females (p=0.73 and 0.16) respectively. The mean decayed teeth in the permanent (DT) and primary dentition (dt) was significantly higher in public school children than private school children (p=0.001 and 0.001) respectively. No significant difference was seen with respect to mean MT, et, FT, ft and TDI between private and public school children (Table 1). The restorative need calculated from decayed teeth and traumatic dental injuries (1.62 ± 1.71) was significantly higher than the restorative need calculated from decayed teeth only (1.55 ± 1.71 ; p<0.001) (Table 2).

Table 1

Comparison of mean DT, dt, MT, et, FT, ft and traumatic dental injuries in private and public school children

	Private school		Public school		p-value
	Mean	SD	Mean	SD	
DT	.36	.81	.62	1.04	0.001; Sig
Dt	1.03	1.45	1.43	1.62	0.001; Sig
MT	.01	.11	.00	.00	-
Et	.03	.23	.01	.10	0.478; NS
FT	.06	.31	.03	.25	0.152; NS
Ft	.17	.63	.02	.13	<0.001; Sig
TDI	0.06	0.25	0.1	0.35	0.188; NS

Table 2

Comparison of restorative need with decayed teeth only and decayed teeth in combination with traumatic dental injuries

	DT + dt + TDI		DT + dt only		p-value
	Mean	SD	Mean	SD	
Restorative need	1.62	1.71	1.55	1.71	<0.001; Sig

DISCUSSION

Our study aimed to evaluate the dental caries, traumatic dental injuries and unmet restorative treatment need among the school children of Udupi. Our study highlighted the need for including the TDI in the evaluation of the URTN. Almost half of the school children had caries experience in the permanent dentition. This was high when compared to the previous studies done by Malvania et al., 2014 (17%)¹ and Sohi et al., 2012 (30.5%)² but similar to the some studies done in India Das et al., 2013 (42.4%)³, Grewal et al., 2011 (52%)⁴ and lower than studies done by Dhar et al., 2009 (63%)⁵; Meghashyam et al., 2007 (64%)⁶, Kalaskar et al., 2015 (65.7%)⁷ and Dash et al., 2002 (66%)⁸. Various factors like diet, social status, oral hygiene measures, availability and utilization of dental care services could be the reasons for the differences in the prevalence rates. The mean DT and dt were significantly higher in public school children than private school children which can be due to their socio-economic status. Many studies evaluated the prevalence of traumatic dental injuries in the past. Our study reported 6% prevalence of traumatic dental injuries which was similar to the studies done by Kaur et al., 2014 (5%)⁹ and Patel and Sujana, 2012 (9%)¹⁰. However, it was lower when compared to the other studies done by Dua and Sharma, 2012 (14.5%)¹¹ and Batra et al., 2014 (15%)¹². However, there were no significant differences when public and private school children were compared. Unmet restorative treatment need accounted for significant burden in terms of oral care. Our study reported that the restorative need calculated from decayed teeth and traumatic dental injuries was significantly higher than the restorative need calculated from decayed teeth only. This suggested that the traumatic dental injuries constitute significant proportion of restorative need and when unmet restorative need is being assessed it should be

included in the assessment. The WHO dentition status and treatment needs would help in evaluating the same. However, it is time consuming and may not be feasible at all times. By supplementing the routine indices with the assessment of traumatic dental injuries, the unmet restorative need can be evaluated. The absolute treatment need that is required can also be evaluated by simply calculating the total number of restorations that are required in a population. This will give the total unmet restorative need along with the average number of restorations per person (mean) and the percentage of individuals that need the restorative treatment. Previous studies have reported only the percentage of individuals that need the restorative treatment (Dash et al.⁸, 63.6%; Dhar et al.⁵, 85.7%) which may not give the true burden of unmet restorative need. Also, previous studies (Grewal et al., 2011⁴ Das et al., 2013³) have reported the need for restorations as one and two surface fillings. This might be due to the fact that many individuals might need one or more teeth that need to be restored which are not reflected when we calculate the treatment need on basis of percentage of individuals that need the restorative treatment. Hence, we propose that the absolute treatment need should be reported along with the percentage of individuals that need the restorative treatment. This would reflect the burden of treatment that has to be addressed by the public health professionals and help plan the preventive programs with minimal resources. Such instances, can also be supplemented with DMFS/defs and PUFA/pufa indices to get more information about the extent of restorations and pulpal involvement in the population.

Acknowledgement: We thank all the school children and teachers for their cooperation.

CONFLICT OF INTEREST

NIL.

REFERENCES

1. Malvania EA, Ajithkrishnan CG, Thanveer K, Hongal S. Prevalence of dental caries and treatment needs among 12-year-old school going children in Vadodara City, Gujarat, India: A cross-sectional study. *Ind J Oral Sci.* 2014 Jan;5(1):3-9.
2. Sohi RK, Gambhir RS, Veerasha KL, Randhawa AK, Singh G. Assessment of prevalence of dental caries among 5 and 12-year-old schoolchildren in Chandigarh (U.T.), India. *Arch Oral Res.* 2012 Jan;8(1):39-45.
3. Das D, Misra J, Mitra M, Bhattacharya B, Bagchi A. Prevalence of dental caries and treatment needs in children in coastal areas of West Bengal. *Contemp Clin Dent* 2013 Oct;4(4):482-7.
4. Grewal H, Verma M, Kumar A. Prevalence of dental caries and treatment needs amongst the school children of three educational zones of urban Delhi, India. *Indian J Dent Res* 2011 Apr;22(4):517-9.
5. Dhar V, Jain A, Van Dyke TE, Kohli A. Prevalence of dental caries and treatment needs in the school-going children of rural areas in Udaipur district. *J Indian Soc Pedod Prev Dent* 2007 Mar;25(3):119-21.
6. Meghashyam B, Nagesh L, Ankola A. Dental caries status and treatment needs of children of fisher folk communities, residing in the coastal areas of Karnataka region, south India. *West Indian Med J* 2007 Jan;56(1):96-8.
7. Kalaskar RR, Kalaskar AR, Chandorikar H, Hazarey S. Prevalence of dental caries and treatment needs in school going children of Vidarbha region, central India. *Univ Res J Dent* 2015 May;5(2):68-72.
8. Dash JK, Sahoo PK, Bhuyan SK, Sahoo SK. Prevalence of dental caries and treatment needs among children of Cuttack (Orissa). *J Indian Soc Pedod Prev Dent* 2002 Apr;20(4):139-43.
9. Kaur A, Awasthi S, Mittal S, Sharma S, Bector A, Singh R. Prevalence And Etiology Of Traumatic Dental Injuries In 7 To 10 Years Old Children From Various Schools In And Around Baddi, Himachal Pradesh. *Ind J Dent Sci.* 2014 Sep;6(3):16-19.
10. Patel MC, Sujana SG. The prevalence of traumatic dental injuries to permanent anterior teeth and its relation with predisposing risk factors among 8-13 years school children of Vadodara city:an epidemiological study. *J Indian Soc Pedod Prev Dent* 2012 Apr;30(2):151-7.
11. Dua R, Sharma S. Prevalence, causes and correlated of traumatic dental injuries among seven to twelve year old school children in Dera Bassi. *Contemp Clin Dent* 2012 Jan;3(1):38-41.
12. Batra M, Kandwal A, Gupta M, Tangade P, Dany SS, Rajput P. Prevalence of Dental Traumatic Injuries to Permanent Incisors in Indian Children: A Cross-sectional Survey. *J Dent Sci Oral Rehab* 2014 Jan;5(1):1-4.
13. World Health Organisation , Oral Health Survey, basis methods, 4th edition, geneva, WHO, 1997.