



IMPACT OF UNTREATED DENTAL CARIES ON SCHOOL ATTENDANCE AMONG THE PRESCHOOL CHILDREN

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ABSTRACT

Introduction -Optimum oral health is required to eat, socialize without discomfort or embarrassment. Studies have observed that more than 60-70% of children are affected by dental caries. Untreated dental caries – most common problems faced by the population in developing countries leading to frequent school absences affecting the development of the child.

Material and Methods – it was a Cross sectional study conducted among 3-5 years old preschoolers. Ethical approval was obtained prior to start of the study from IEC. Sample size was 260. To measure dental caries – dmf and pufa index was used. Descriptive statistics, Pufa ratio and Pearson correlation was analysed using SPSS ver 16.0.

Results -Prevalence of dental caries was 32% and pufa was 24%. Pufa ratio was calculated to 34%. Moderate to strong Correlation was found between pufa and school days lost.

Discussion and Conclusion - On analysis moderate to strong correlation was observed between the untreated dental caries and loss of school days among the study participants. Proportion of untreated dental caries was high which points to the need for diverting attention to care of deciduous dentition. Similarly the impact of untreated caries reverberated as missed learning opportunities can be an advocacy talking point for the policy lawmakers and legislators.

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INTRODUCTION

Optimum oral health is required to eat, socialize without discomfort or embarrassment. Oral health affects the general health and well being of the people. Oral diseases like dental caries and periodontal diseases are most common diseases found among all the age groups. Prevalence of dental caries is declining in developed countries it is not the case in developing countries.¹

Studies have observed that more than 60-70% of children are affected by dental caries. Untreated dental caries is most

common problems faced by the population in developing countries. The global epidemic of dental decay affects more than 90% of the world's population: between 40% and 90% of 12-year-olds have dental decay and its consequences, such as pain, chronic infection, absenteeism, low quality of life, and effects on growth, development, and educational performance. In low-resource countries almost all decay remains untreated.^{2,3}

Especially the children have to bear the brunt of the consequence of caries as it Affects - the daily activities in life,

Nutritional status and quality of life and Later successes in life. Hence it can be said that it is a significant clinical and public health problem.¹

Pre schools cater to the needs of children in age group of 3-5 years. It is here that the foundation for Personal, social, and emotional development, Communication skills, Physical development and Scientific thinking are formed. Frequent school absences due to ill-health affect the development of the child.⁴ More than 51 million school hours are lost annually because of illnesses related to dental problems Odontogenic infections leading to pain and discomfort and systemic symptoms are most common complaints which are initiated due to untreated dental caries. Such frequent absences affect the development of the child.¹

Quantifying the loss of hours as a consequence of non treatment of odontogenic infections will help in placing the appropriate emphasis on the need to improve the accessibility and affordability of dental care for deciduous dentition In India prevalence of dental caries among the children in age group has been commonly assessed. But the data on consequence of untreated dental caries and impact of untreated caries in terms of absence from school (pre schoolers) is scarce. Most of the studies have assessed the prevalence of caries among the preschoolers.⁵⁻⁹

With this background this study was conducted to assess the prevalence of untreated dental caries among the preschoolers of Karad city and to assess the impact of untreated dental caries on Preschool attendance.

MATERIAL AND METHODS

This was a Cross sectional study conducted from January – March 2014 among 3-5 years old Preschoolers of Karad city, Maharashtra India. Karad is a town situated in Satara district western part of the country with an average population of more than 75, 000 and average literacy rate of 76%, higher than the national average of 59.5%: 11% of the population is under 6 years of age.¹⁰

Ethical approval was obtained prior to start of the study from IEC. Informed consent was obtained from parents and permission was sought from concerned authorities.

Children present on the day of examination, with positive parental consent and who were co-operative for clinical examination were included in the study. Medically compromised children, those who were absent on the day of examination were excluded from the study.

Pilot study was conducted among 30 randomly selected students to assess the prevalence of untreated dental caries. Based on the prevalence, precision of 90% and error of 5% sample size was calculated at 260.

List of pre- schools in the study area were obtained from the DDPI office. From the list of pre schools, two were selected by systematic random sampling and from them children were selected by simple random sampling technique.

To measure dental caries dmft (gruebbel A O 1944) and to measure untreated dental caries pufa index by monse *et al*¹¹ was used. Examiner was trained and calibrated at the dental unit of department of public health dentistry, school of dental sciences, karad, India and kappa was calculated to be 0.8 and 0.86 for both the indices indicating high degree of conformity.

‘dmf’ index includes decayed missing and filled teeth components to assess the caries experience for deciduous dentition. Similarly pufa index includes following components.

Pulpal (p)	Open pulp chamber is visible or the caries process destroyed the tooth crown leaving the roots
Ulceration (u)	Sharp edges of a tooth with pulpal involvement caused a traumatic ulceration of surrounding, e.g. lingual or buccal mucosal tissues
Fistula (f)	The presence of an active fistula related to a tooth with pulpal involvement
Abscess (a)	Oedema of soft tissues related to a tooth with pulpal involvement

The clinical examination was carried out on dental chair under adequate illumination. Only a visual assessment, without the use of a dental probe, was carried out to assess ‘pufa’ index and for ‘dmf’ assessment mouth mirror and dental explorer were used. In case of presence of debris which impeded the examination tweezers and cotton was used to clean the surfaces of the teeth.

To assess the loss of school hours due to dental problems parents/ caretakers were questioned “during past six months how many days has your child missed school due to reasons to tooth ache/ dental problems”

All the data was compiled and summarized. Descriptive statistics was computed to assess the prevalence of the untreated dental caries. Pufa ratio was calculated using the formula $pufa/d \times 100$. Pearson correlation was calculated for untreated dental caries and loss of school days. The data was analysed using spss ver 16.0 and P value was set at <0.05 as significant

RESULTS

Table 1 shows the sample characteristics. The mean age of the participants was 4.3 ± 0.8 years and the gender distribution was nearly equivalent. Prevalence of dental caries was 32%. ‘D’ decayed component formed 95% of dmft. Prevalence of pufa was 24% of sample. Pufa ratio was found to be 34%. Correlation (r) pufa and school days lost was 0.63 which showed moderate to strong correlation between the two factors. ($p < 0.02$)

Table 1 shows the demographic and clinical characteristics of the study sample

Variables	Mean (\pm SD)
Age (years)	4.3 \pm 0.8
Gender	
Male	158 (52%)
Female	142 (48%)
Total	300 (100%)
Mean dmft	2.57 \pm 0.56
p	1.56 \pm 0.40
u	0.00 \pm 0.0
f	0.00 \pm 0.0
a	0.11 \pm 0.01
pufa	1.56 \pm 0.45
Mean absent days	3.20 \pm 1.3

DISCUSSION

This study was conducted to assess the prevalence of untreated dental caries among children of age 3-5 years. In this study the prevalence of dental caries was 32%. It was similar to studies conducted in various parts of the country where the prevalence was found to be ranging from 32.6% to as high as 63%.

In this study prevalence of pufa codes was 24%. This was less than that observed in other studies by Mehta *et al* 2014

(38.6%)¹², Monse *et al* in Philippines (85%)¹¹ and Bagińska *et al.*¹³ among Polish children (43.4%)

“p” component of pufa formed majority of the total score. These findings are comparable to studies reported earlier.¹¹⁻¹³ In this study very few cases of other components of pufa like abscess were observed. Findings are Similar to the findings of other studies. This further substantiates the need to modify the index by eliminating ‘u’ and combining ‘f’ and ‘a’ components.¹⁴

Mean pufa value was reported to be 1.56± 0.45 and it was less than that reported by Monse *et al*¹¹ among 6 years old which was 3.4. But the mean pufa value of our study was higher than that reported by Mehta A *et al* 0.9 in Chandigarh 2014¹², Figueiredo *et al* Brazil (0.4)¹⁴ and others¹³. Pufa ratio was found to be 34%. This pufa ratio is the untreated caries ratio and it explains that nearly 34% of ‘d’ component progressed to odontogenic infections.

The mean absent days/ hours lost due to dental pain was 3.2 days / 12 hours per person in 6 months. No Data regarding this aspect Indian subcontinent so comparison is not possible. On analysis moderate to strong correlation was observed between the untreated dental caries and loss of school days among the study participants. Students with higher proportion of untreated dental caries were more likely to miss the schools due to tooth ache. Similar observations were reported in 2011 by Jackson *et al*¹⁵ among American children. In which the author stated that Children with poorer oral health status were more likely to experience dental pain, miss school, and perform poorly in school.

This study was an attempt to assess the prevalence of untreated dental caries among pre schoolers and to assess its correlation with the loss of school days. Most of the above comparisons for prevalence and for the pufa ratio cannot be considered valid as pufa studies have not been carried out in this age group of 3-5 years.

Similarly the data on missed school hours in other studies consider children above 6 years. Data regarding the missed hours among this age group is not available. This definitely does not underscore the importance of missing the pre schools hours in this age group. Preschools as has been mentioned are foundation for future learning experience of children. School absences mean missed opportunities for learning and academic advancement.

Children experiencing pain are more likely to be distracted and unable to concentrate on schoolwork. In addition, chewing difficulties due to dental problems often lead to limited choice of foods and poor nutrition with further impact performance. Missed school days are likely to be correlated with missed days of work for parents who have to take children for treatment or take care of them at home. Consider the influence of socio demographic factors, dental visiting patterns, Age wise, Gender wise comparison

Proportion of untreated dental caries was high which points to the need for diverting attention to care of deciduous dentition. Similarly the impact of untreated caries reverberated as missed learning opportunities can be an advocacy talking point for the policy lawmakers and legislators to shed light on the need to prioritise dental care among preschoolers and children so that improving children’s oral health status may be a vehicle to enhancing their educational experience.

References

- Peterson P, Bourgeois D, Ogawa H, Estupian-day S, Ndiaye C. The global burden of oral diseases and risk to oral health. *Bulletin of World Health Organization* 2005; 83: 661-669.
- Beaglehole R, Benzian H, Crail J, Mackay J. The oral health atlas: mapping a neglected global health issue. Geneva & Brighton: FDI World Dental Education Ltd & Myriad Editions, 2009.
- Sylva K. School Influences on Children's Development. *J Child Psychol. Psychiat.* 1994; 35: 135-170.
- Singh S, Vijayakumar N, Priyadarshini HR, Shobha M. Prevalence of early childhood caries among 3-5 year old pre-schoolers in schools of Marathahalli, Bangalore. *Dent Res J (Isfahan)*. 2012; 9: 710–714.
- Priyadarshini HR, Hiremath SS, Puranik M, Rudresh SM, Nagaratnamma T. Prevalence of early childhood caries among pre-school children of low socioeconomic status in Bangalore city, India. *Journal of International Society of Preventive and Community Dentistry* 2011; 1: 27-30.
- Mahejabeen R, Sudha P, Kulkarni SS, Anegundi R. Dental caries prevalence among preschool children of Hubli: Dharwad city. *J Indian Soc Pedod Prev Dent*. 2006; 19-22.
- Tyagi P. The Prevalence and Pattern of Dental Caries in Pre-School Children People’s *Journal of Scientific Research*. 2009; 2: 1-4.
- Sachit A, Sumeet S, Puneet A, Darrel S, Anil C. Prevalence Of Dental Caries Among Pre-school Children of greater Noida City , UP (India). *Indian Journal of Dental Sciences*. 2012; 4: 4-6.
- "Census of India 2001: Data from the 2001 Census, including cities, villages and towns (Provisional)". Census Commission of India. Archived from the original on 2004-06-16. Retrieved 2008-11-01.
- Monse B, Heinrich-Weltzien R, Benzian H, Holmgren C, van Palenstein Helder W. PUFA--an index of clinical consequences of untreated dental caries. *Community Dent Oral Epidemiol*. 2010; 38:77-82.
- Mehta A, Bhalla S. Assessing consequences of untreated carious lesions using pufa index among 5-6 years old school children in an urban Indian population. *Indian J Dent Res* 2014;25:150-3
- Bagińska J, Rodakowska E, Wilczyńska-Borawska M, Jamiołkowski J. Index of clinical consequences of untreated dental caries (pufa) in primary dentition of children from north-east Poland. *Adv Med Sci*. 2013; 58:442-427.
- Figueiredo MJ, de Amorim RG, Leal SC, Mulder J, Frencken JE. Prevalence and severity of clinical consequences of untreated dentine carious lesions in children from a deprived area of Brazil. *Caries Res* 2011; 45: 435-442.
- Jackson S, Vann, Jr W, Kotch J, Pahel B, Lee J. Impact of Poor Oral Health on Children's School Attendance and Performance. *Am J Public Health*. 2011; 101: 1900–1906.