

Original article

Dental caries experience among school children of Eastern Nepal - significant caries index

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Abstract

Background: Dental caries, an infectious microbiologic disease of dental hard tissues, is a common public health problem worldwide. The distribution of dental caries studied in any population, shows that a few in the population experience a lot of decayed teeth and most do not experience any at all or experience very little.

Objective: To assess the extent and severity of dental caries among 5-12 years old children of eastern Nepal using DMFT (Decayed, Missing and Filled teeth) and SiC (Significant Caries) index. **Methods:** Six hundred and sixteen 5-12 years old school children were examined for decayed, missing and filled teeth using WHO criteria. DMFT, dft (decayed filled teeth) and SiC Indices were calculated. **Results:** The mean dft and SiC* were 1.84 and 4.60 respectively, whereas mean DMFT and SiC were 0.33 and 0.92 respectively. **Conclusion:** SiC gives a better picture of the at risk population, hence it should be widely used along with dft/DMFT.

Keywords: children, dental caries, Nepal, SiC index

Introduction

Dental caries, an infectious microbiologic disease of dental hard tissues, is a common public health problem worldwide. The distribution of dental caries studied in any population, shows that a few in the population experience a lot of decayed teeth and most do not experience any at all or experience very little.¹ DMFT (Decayed, Missing and Filled Teeth) index gives out an average or mean caries prevalence in any population. Expressing caries prevalence as the mean DMFT value does not correctly reflect the skewed distribution, leaving high caries groups undiscovered in the population.² Significant caries index (SiC) was introduced by Douglas Bratthall in 2000 to identify the magnitude of dental caries amongst the children who suffer from it the most.³ In Nepal many studies

regarding the severity and extent of dental caries have been done using DMFT index but SiC index has been used sparsely. Studies^{4,5,6} done using DMFT index show the prevalence and severity of dental caries within the goal set by the World Health Organization (WHO). The SiC index has not been used in the eastern region of Nepal. So, the scenario of the most affected population is not known. Therefore, the purpose of the present study was to assess the extent and severity of dental caries among 5-12 year old children of eastern Nepal using DMFT and SiC index.

Methods

It was a cross-sectional study conducted on a randomly selected sample of school children in Dhankutta and Sunsari districts of eastern Nepal. Six schools were selected as part of school oral health program through a convenience sampling method. The schools were officially informed and assured about the confidentiality of the research findings. Written consent was

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taken from the schools as well as guardians. The students, aged 5-12 years were included in the study. A total of 616 children participated in the study. Oral examinations were carried out in classrooms using a mouth mirror and a ballpoint probe under adequate daylight. Radiographs were not taken. Dental caries was recorded at cavitation level. The number of carious, missing and filled teeth as well as surfaces were recorded on examination forms as per WHO guidelines. The missing component for primary dentition was not recorded because of the difficulty in distinguishing between teeth extracted for caries and exfoliation.⁷ For primary dentition, dft/dfs (decayed filled teeth/surface index) and for permanent dentition DMFT/DMFS (Decayed Missing Filled Teeth/Surfaces index) were used as the standard tool to record dental status of the children. The SiC Index was calculated as follows: individuals were sorted according to their DMFT values. The one third of the population with the highest caries scores was selected. The mean DMFT for this subgroup was calculated. This value constituted the SiC Index.³ Data was entered into the computer and statistical analyses were carried out using SPSS 20. Descriptive statistics such as mean and standard deviation were calculated. Independent sample t test was used to find difference in values between selected groups. The level of significance was taken as $p < 0.05$.

Results

A total of 616 children participated in the study. The male female ratio was 1:1. It was observed that 4.7% had primary dentition, 88% had mixed dentition and 7.3% had permanent dentition. Hence, 571 children were assessed for dt, ft, dft and SiC* (Table 1) whereas 587 were assessed for DT, MT, FT, DMFT and SiC (Table 2).

In primary dentition, the mean dft was 1.84 and SiC* was 4.60. The prevalence of dental caries was 45.7%. The mean number of dt, ft and dft among males were 1.81, 0.04 and 1.85 respectively. Similarly, the mean number of dt, ft and dft among females were 1.77, 0.02 and 1.83 respectively. There was no significant difference in the caries status among the boys and girls in the primary dentition (Table 3).

In the permanent dentition, the mean DMFT was 0.32 and SiC was 0.92. The prevalence of dental caries was 56%. When the caries status was compared between genders, it was observed that girls had higher DT and DS as well as higher DMFT/DMFS compared to boys which was statistically significant (Table 4). None of the children had missing permanent teeth.

Table 1: Mean decayed and filled teeth in primary dentition

	Mean and SD
dt	1.79 ± 0.10
ft	0.03 ± 0.00
dft	1.84 ± 0.10
SiC*	4.60 ± 2.66
ds	2.95 ± 0.20
fs	0.04 ± 0.01
dfs	3.08 ± 0.21
Prevalence of dental caries	45.7 %

Table 2: Mean decayed, missing and filled teeth in permanent dentition

	Mean and SD
DT	0.32 ± 0.03
MT	0.00
FT	0.01 ± 0.002
DMFT	0.32 ± 0.03
SiC	0.92 ± 1.12
DS	0.36 ± 0.03
MS	0.00
FS	0.01 ± 0.003
DMFS	0.36 ± 0.03
Prevalence of dental caries	56 %

Table 3: Comparison of dt, ft, dft, ds, fs and dfs between male and female school children

	Male	Female	t-value	p value	95 % CI
dt	1.81 ± 2.53	1.77 ± 2.53	0.188	0.851	-0.376 to 0.456
ft	0.04 ± 0.26	0.02 ± 0.14	0.807	0.420	-0.021 to 0.049
dft	1.85 ± 2.55	1.83 ± 2.60	0.089	0.929	-0.405 to 0.443
ds	2.92 ± 4.77	2.98 ± 5.23	-0.127	0.899	-0.877 to 0.771
fs	0.04 ± 0.26	0.04 ± 0.31	-0.128	0.898	-0.051 to 0.045
dfs	2.98 ± 4.83	3.19 ± 5.55	-0.496	0.620	-1.072 to 0.640

Table 4: Comparison of DT, MT, FT, DMFT, DS, MS, FS and DMFS between male and female school children

	Male	Female	t-value	p value	95 % CI
DT	0.22 ± 0.68	0.41 ± 0.86	- 2.976	0.003*	- 0.318 to - 0.065
MT	0.00	0.00 ± 0.05	- 1.012	0.312	- 0.010 to 0.003
FT	0.01 ± 0.08	0.00 ± 0.05	0.557	0.577	- 0.008 to 0.015
DMFT	0.23 ± 0.70	0.42 ± 0.87	- 2.872	0.004*	- 0.317 to - 0.060
DS	0.26 ± 0.85	0.46 ± 1.01	- 2.574	0.010*	- 0.351 to - 0.047
MS	0.00	0.00	-	-	-
FS	0.01 ± 0.08	0.00 ± 0.05	0.577	0.577	- 0.008 to 0.015
DMFS	0.27 ± 0.87	0.46 ± 1.02	- 2.495	0.013*	- 0.300 to - 0.042

*significant (p < 0.05)

Discussion

The present study investigated the dental caries prevalence and severity using dft, DMFT and SiC indices. The dft and DMFT values of the children were well within the national⁴ and WHO goals.³ It was observed that dt, ft and dft were more in males compared to females whereas ds and dfs were more in females compared to males. The results of the study showed a low dft as well as DMFT which is encouraging but at the same time the SiC values were comparatively high. The dft value was 1.84 compared to the SiC* which was 4.60. Similarly, the mean DMFT is 0.32 and the SiC index for same population was 0.92. Hence, it can be interpreted that children who are carrying the burden of dental caries the most in the population, have approximately thrice the amount of caries as compared to the average dental caries in the population which was similar to other studies.⁸⁻¹⁹ Although the use of DMFT has been an accepted practice for assessing the prevalence and severity of caries in a population, the epidemiologic changes in the dental caries picture during the last 2-3 decades, have made it increasingly evident that mean DMFT values do not capture the polarized caries development with a more skewed distribution of dental caries.⁸ It would be quite unrealistic if we focus only on dft/DMFT which is evident from the study. Although the dental caries level is low, a minority of children still has substantial levels of disease experience. These children afflicted with a disproportionate burden of dental disease should be given priority.⁹

Conclusion

The study provides an evidence that although caries levels have declined over past several years, there continues to be a large 'at risk' group for whom caries remain a major problem. The early identification of these high caries risk groups continues to be a major challenge for public health workers. The SiC is designed to focus attention on those individuals; hence it should be widely used along with the dft/DMFT indices.

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