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Original Article

Dental caries experience of pre-school children in Mangalore, India

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Abstract

Background: The present study was done to assess the dental caries experience of pre-school children aged 3-5 years in Mangalore city.

Materials and methods: Clinical assessment of dental caries was done by Dentition status and treatment need (WHO Oral Health Assessment Form, 1997) using dentition status part only and decayed, missing and filled teeth were calculated from the information.

Results: The prevalence of dental caries among anganwadi children was 81.4%. Among the kindergarten children the prevalence of dental caries was 62.3%. The mean dmft among the anganwadi children was 4.62 (3.82) and among kindergarten children the mean dmft score was 3.42 (3.77).

Conclusion: A significant negative association between dental caries experience and frequency of cleaning the teeth was found in this study. The caries prevalence and mean dmft was higher among anganwadi children. Prevalence of filled teeth was higher among kindergarten children.

Key words : Caries experience, Dentition status, Pre – school

Introduction

Dental caries remains the principal disease affecting pre-school children. It is the most prevalent unmet health care need of children. At the point of cavitations, caries experience is irreversible and cumulative and prevention is both preferable and possible. This care must start early.

Studies have shown that not all children are at equal risk for developing caries[1,2]. If a high risk group of children with primary tooth caries can be identified and characterized, it would be useful to determine whether preventive measures should be applied to all children, or targeted for those with elevated risk. In a time of increasing costs of dental services, these questions have important implications. For this we need to have a baseline data. Hence an attempt has been made to collect baseline data by assessing dental caries experience of children aged 3-5 years going to anganwadi and kindergarten in Mangalore.

Aim

To assess the dental caries experience of pre-school children aged 3-5 years in Mangalore.

Materials and methods

This cross-sectional study was conducted on 768 children aged 3-5 year olds going to anganwadi and kindergarten schools in Mangalore.

The list of kindergarten and anganwadi schools in Mangalore was obtained from the Mangalore City Corporation Office. Before starting the study official permission was obtained from all the concerned authorities;

1. Child Development Project Officer
2. Head Master/Mistress/Principal of Kindergarten/ Anganwadi schools
3. Class teacher
4. Parents

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Calibration Exercise was undertaken by the investigator, which indicated a substantial agreement (0.8).

After the calibration, a pilot study was carried out on 30 children from each group. The following formula was applied to get the sample size.

$$N = \frac{2\,(1.74)\,(SD^2A + SD^2K)}{D^2}$$

SDA=Standard deviation of anganwadi group

SDK= Standard deviation of kindergarten group

D = Difference between means

From the list of Kindergarten/Anganwadi of Mangalore city, the study sample was obtained by simple random sampling procedure, using random number table.

A sample size of 750 was estimated based on results of the pilot study. A total of 768 subjects were included in the study. Out of those 382 children were from anganwadi and 386 from kindergarten. Among them 359 (46.5%) were males and 409 (53.3%) were females.

Autoclaved instruments were used to examine the students. Each tooth surface was examined with the use of an explorer, mouth mirror and CPI probe. Clinical assessment of dental caries was done by Dentition status and treatment need (WHO Oral Health Assessment Form, 1997)[3] using dentition status part only and decayed, missing and filled teeth were calculated from the information. Appropriate arrangements were made for the children who required care and treatment. Survey findings were reported to respective authorities on same day.

Statistical analysis

The data was entered into the computer using SPSS (11.0) package and analyzed using chi-square test.

Results

An epidemiological study was conducted on 382 anganwadi and 386 kindergarten children of Mangalore to find out their dental caries experience.

Out of the 382 children in the anganwadi group, 183 (47.90%) were males and 199 (52.10%) females. In the kindergarten group, there were 176 (45.6%) males and 210 (54.40%) females. The difference was not statistically significant (p>0.521).

Table 1 and Table 2 depicts distribution of intake of snacks and rinsing after every meal, which was highly significant (p<0.004). Table 3 and Table 4 shows oral hygiene practices of both groups. (Fig 1).

Regarding previous visit to a dentist, more kindergarten children (39.60%) compared to anganwadi children (19.60%) had visited the dentist. And the reasons for visiting a dentist, 44 (11.50%) of anganwadi children and 68 (17.10%) of kindergarten children visited the dentist for tooth pain. Twenty anganwadi children (5.20%) and 45 (11.70%) kindergarten children visited the dentist for regular dental check-ups,8 (2.10%) anganwadi children and 6 (1.60%) of kindergarten children visited the dentist for bleeding from the gums. These responses showed very high statistical significance. (p<0.001).

The prevalence of dental caries among anganwadi children was 81.4%. Among the kindergarten children the prevalence of dental caries was 62.3%. This difference was very highly statistically significant. (p < 0.001)

Table 5 depicts dental caries experience among kindergarten and anganwadi children. (Fig 2). The mean dmft among the anganwadi children was 4.62 (3.82) and among kindergarten children the mean dmft score was 3.42 (3.77). The difference was very highly statistically significant (p < 0.001).

Table 6 shows the mean dmft score in males was 5.09 (4.08) and females 4.20 (3.51) for anganwadi children.

The mean dmft in relation to oral hygiene practice among anganwadi children was 4.55 (3.81) and 8.12 (2.23) for the toothbrush and finger users. Statistically the difference was highly significant when the mean dmft of anganwadi was related to oral hygiene practice. (p < 0.009). The mean dmft in relation to oral hygiene practice among kindergarten children was 3.42 (3.77) for the toothbrush users.

Table 7 and Table 8 showing the mean dmft in relation to the material used for cleaning the teeth and to frequency of cleaning the teeth among both groups. A majority of children in both the group used toothpaste. However, ten children from anganwadi group used charcoal and two children used salt for cleaning their teeth, whereas only one child from kindergarten group used charcoal and none used salt.

Table 1: Distribution of pre-school children according to frequency of eating snacks in between meals

	Anganwadi	Kindergarten
Once	259(67.80%)	293(75.90%)
Twice	95(24.90%)	79(20.50%)
Thrice	13(3.40%)	12(3.10%)
More than three times	15(3.90%)	2(0.50%)

X^2=13.526 p<0.004 hs

Table 2: Distribution of pre-school children according to whether they rinse after every meal

	Anganwadi	Kindergarten
Yes	283(74.10%)	319(82.10%)
No	62(16.20%)	33(8.50%)
Rarely	37(9.70%)	34(8.80%)

X^2=26.823 p<0.001 vs

Table 3: Distribution of pre-school children according to material used for cleaning the teeth

	Anganwadi	Kindergarten
Toothpaste	354(92.70%)	382(99.00%)
Toothpowder	16(4.20%)	3(0.80%)
Charcoal	10(2.60%)	1(0.30%)
Salt	2(0.50%)	0(0.00%)

X^2=19.303 p<0.001 vhs

Table 4: Distribution of pre-school children according to frequency of cleaning the teeth

	Anganwadi	Kindergarten
Occasionally	48(12.60%)	12(3.10%)
Once	236(61.80%)	168(43.50%)
Twice	95(24.90%)	204(62.80%)
More than twice a day	3(0.80%)	2(0.50%)

X2=72.692 p<0.001 vhs

Table 5: Dental caries experience – group-wise

		No.	Mean	S.D.	p
Decayed teeth	**Anganwadi**	360	4.86	3.70	0.001vhs
	Kindergarten	341	3.70	3.76	
Missing teeth	**Anganwadi**	36	0.39	0.83	0.91ns
	Kindergarten	63	0.37	1.09	
Filled teeth	**Anganwadi**	8	0.63	0.51	0.258 ns
	Kindergarten	39	0.95	0.75	
Total dmft	**Anganwadi**	382	4.62	3.82	0.001vhs
	Kindergarten	386	3.42	3.77	

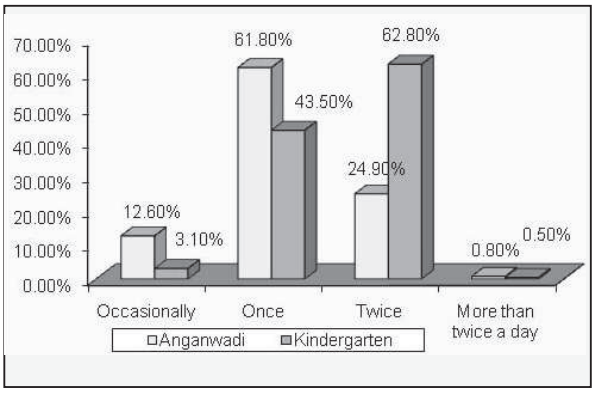

Fig. 1: Distribution according to frequency of cleaning the teeth

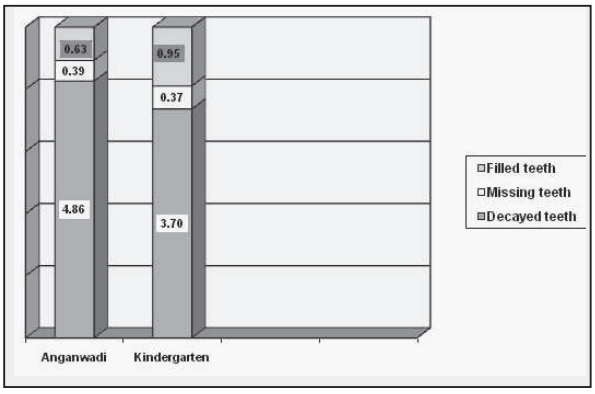

Fig. 2: Dental caries experience among pre-school children

Table 6: Dental caries experience – sex - wise

		Sex	Mean	S.D.	p
Anganwadi	**Decayed teeth**	**Male**	5.04	4.00	0.022 sig
		Female	4.15	3.48	
	Missing teeth	**Male**	0.05	0.35	
		Female	0.03	0.18	
	Filled teeth	**Male**	0	0	
		Female	0.03	0.15	
	dmft index	**Male**	5.09	4.08	
		Female	4.20	3.51	
Kindergarten	**Decayed teeth**	**Male**	3.10	3.52	0.574 ns
		Female	3.41	3.90	
	Missing teeth	**Male**	0.09	0.64	
		Female	0.04	0.19	
	Filled teeth	**Male**	0.12	0.35	
		Female	0.08	0.38	
	dmft index	**Male**	3.30	3.54	
		Female	3.52	3.96	

Table 7: Mean dmft according to material used for cleaning the teeth

		No.	Mean	S.D.	p
Anganwadi	**Toothpaste**	354	4.50	3.73	0.15ns
	Toothpowder	16	6	5.36	
	Charcoal	10	6	3.55	
	Salt	2	8	4.24	
Kindergarten	**Toothpaste**	382	3.44	3.78	0.4ns
	Toothpowder	3	2	2	
	Charcoal	1	0	-	

Table 8: Mean dmft scores according to frequency of cleaning the teeth

Anganwadi	**Occasionally**	48	5.35	3.55	0.15ns
	Once	236	4.84	3.91	
	Twice	95	3.76	3.64	
	More than twice a day	3	3.33	1.15	
Kindergarten	**Occasionally**	12	3.66	4.55	0.96ns
	Once	168	3.50	3.86	
	Twice	204	3.33	3.68	
	More than twice a day	2	3.33	0.68	

Discussion

In this study, 75 (19.6%) anganwadi and 153 (39.6%) kindergarten children had visited a dentist. It was also observed that out of the 382 anganwadi children who were examined, 81.4% were affected by dental caries as compared to 62.3% among the 386 kindergarten children. The prevalence of dental caries is higher than those found in another study conducted in Mangalore[4].

Dental caries prevalence in the present study is similar to those found in some regions of Brazil such as Natal-RN and Rio de Janeiro State, as well as in the public schools of Argentina[5]. In this study caries prevalence was higher in those studying in anganwadi than those studying in kindergarten. Freire MGM, Melo RB, Silva SA reported in their study that caries prevalence was higher in the group of children attending public nursery schools than those attending private ones[5]. Koloway B, Kailis DG[1] observed caries prevalence of 90.5% in urban and 95.9% in rural children in Indonesia. Tewari A,Chawla HS[6] observed higher caries prevalence among children living in urban areas in high socio-economic status (52.31%) than those from low and middle socio-economic status (50.30%).

In the present study the mean dmft was 4.62 among anganwadi and 3.42 among kindergarten children. These scores were comparable to the mean dmft score (3.8) observed by Seow WK, Amaratunge A, Bennett R[7] in Aboriginal pre-school children in Brisbane and 3.0 by Al-Mohammadi SM, Rugg-Gunn AJ, Butler TJ[2] in 1994 among boys aged 4 years in Riyadh. In Brazil, the mean dmft at the age of 3 was 1.33, at the age of 4 it was 2.48 and at the age of 5 it was 3.50.The mean dmft found in this study was higher than those of Freire MCM, Melo RB, Silva SA[5] Sudha P, Bhasin S[4] and Holbrook WP, Kristinsson MJ, Gunnarsdottir S, Briem B (mean dmft 2.4)[8]. Similar findings were seen in a study reported by Kumar MP, Joseph T, Verma RB, Jayanthi M[9] in 2005.

In the present study, the mean number of decayed deciduous teeth (dt) for the anganwadi children was 4.86 (3.70) and 3.70 (3.70) for the kindergarten children. These findings are in accordance with the observation of Sayegh A, Dini EL, Holt RD et al[10].

The mean number of filled teeth among anganwadi children was 0.63 (0.51) and in kindergarten children 0.95 (0.75).The mean number of filled teeth was 0.3(1.00) in Seow WK, Amartunge A, Bennett R et al study[7].

Summary and conclusions

- Majority of children from both the groups used toothpaste and toothbrush for cleaning. Majority of anganwadi children cleaned once daily compared to kindergarten where majority of children cleaned twice daily.
- A significant negative association between dental caries experience and frequency of cleaning the teeth was found in this study.
- Regarding previous visit to a dentist, more number of kindergarten children had visited the dentist compared to anganwadi children and the main reason to visit the dentist was tooth pain in kindergarten children.
- The caries prevalence and mean dmft was higher among anganwadi children. Prevalence of filled teeth was higher among kindergarten children.

Recommendations

The high caries experience in anganwadi and kindergarten children in this study is a cause for concern. With approximately 25 million children aged 0-5 years, a dentist-based and treatment-based oral health service would consume a very large part of the nation's resources. Therefore, an oral health programme aimed at increasing preventive measures and dental health education needs to be initiated.

Monitoring of dental health should take place before the age of five. Educational programs involving direct contact with pregnant women, parents and other caretakers, such as baby sitters and grandparents, are essential.

Parents should be educated about the need for earlier and regular dental attendance. They should be made aware of the brushing methods, daily use of an accepted fluoride dentifrice, usage of pit and fissure sealants and the importance of topical fluoride application for children.

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