

## Assessment of oral health status among primary and higher primary Government School Children in Bangalore South-1: A cross - sectional study

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### Abstract

**Aim:** To determine the oral health status among primary and higher primary government school children in Bangalore South-1, Karnataka, India. **Material and Methods:** A descriptive cross sectional study was conducted in 1050 primary and higher primary Government school children of Bangalore South -1. The data with regard to oral health status was determined using WHO oral health assessment form-1997. **Results:** The survey found that only 2 (0.19%) subjects had oral mucosal lesions, 33(3.06%) were having enamel opacities/hypoplasia, 80 (7.42%) had dental fluorosis, 114(10.39%) were suffering from periodontal health problem, 631 (58.53%) were suffering from dental caries and only 2.14% of subjects had malocclusion. **Conclusion:** In the present study more than half of the study subjects were suffering from oral diseases, like dental caries and they require restorations.

**Keywords:** School Children; Oral health status; Government school

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This article may be cited as: Raina R, Pavithran VK, Kumar V, Kumari AH, Ahsan S and Raina S. Assessment of oral health status among primary and higher primary Government School Children in Bangalore South-1: A cross - sectional study. *Int J Com Health and Med Res* 2017;3(1):90-95

Article Received: 1-02-17

Accepted On: 12-03-2017

### INTRODUCTION

In India, children form about 38-40% of its 1090 million total populations, and 85% of them have high levels of dental disease.<sup>1</sup> It is reported that almost 85% and 35% of children suffer from periodontal disease and mal-aligned teeth and jaws respectively affecting their proper functioning at a point in time.<sup>2</sup> In a Latin American report, dental trauma was found in about 15% of school children, whereas prevalence rates of 5-12% are found in children aged 6-12 years in the Middle East.<sup>3</sup> Dental caries and periodontal diseases are considered as the most important global burdens of oral health. Children suffering from dental caries,

periodontal disease and other oral conditions experience tooth pain, problems with eating, chewing, smiling, communication due to missing, discoloured or damaged teeth that have a major impact on their school activities.<sup>4</sup> The untreated oral problems have a significant influence on the general health of children and on the social and economic wellbeing of communities and more dramatically, it is becoming a disease of the poor and low-income children of all races at risk.<sup>5</sup> In order to assess the magnitude of preventive task, it is necessary to know the extent and severity of the disease.<sup>6</sup> The schools remain an important setting, offering an efficient and effective way to reach

children worldwide and, through them, families and community members. School age is an influential stage in individual's life when lifelong sustainable oral health related behaviours, as well as beliefs and attitudes, are being developed. Children are particularly receptive during this period and the earlier the habits are established, the longer lasting the impact.<sup>7</sup>Hence this study was undertaken to determine the oral health status among primary and higher primary government school children in Bangalore South-1, Karnataka, India. Aim of the present study to assess the oral health status among primary and higher primary government school children in Bangalore South-1, Karnataka, India using WHO Oral Health Assessment Form 1997.

### MATERIALS AND METHODS:

Bangalore is the capital city of Karnataka state. The education to the children residing here is provided through various systems. The primary education is provided mainly through government and private schools. The Government Primary schools are of two types: Government School and Government Aided School which is private but aided by the Government. For administrative convenience the Bangalore district schools are divided into North and South Zones. Each zone is again divided into four subdivisions as North 1, 2, 3, & 4 and South 1, 2, 3, & Anekal subdivision. The present study was conducted in Bangalore South-1 subdivision Government Schools. The children here get the education free of cost, and also they are provided with books, uniforms and mid-day meals at the school premises. Majority of children studying in these schools belong to lower socioeconomic class. Among the total of 623 schools in the Bangalore south-1, 256 were government primary and higher primary schools present during the 2009-2010 academic year, in that 33,042 students were studying, and among them 16,081 boys and 16,961 girls were present. Amid these children 28,269 were primary and higher primary school students.

The sample size formula used in the study was:

$$n = \{Z^2 * (p) * (1-p)\} / C^2$$

Where,

Z = Z value for the confidence level chosen (e.g. 1.96 for 95% confidence level)

p = percentage having a particular disease/problem etc (generally it is taken as 0.5)

C = Confidence interval, expressed as a decimal (generally 0.5, = ±0.5)

From the above formula, the estimated sample size (n) was calculated to be 1050. A total of 1050 subjects were selected by using simple random sampling procedure. Children who got consent from their parents/guardian and those who were present on the day of examination/visit by investigator were included into the study. Physically and mentally challenged children were excluded from the study. The schools were selected using simple random technique from the list of schools obtained from the South -1 Education Board, in which on the day of examination and interview 42 study subjects were selected from each school using simple random method. In the present study, the study subjects were equally distributed to age and gender in each school. Three eligible boys and girls were selected randomly from each age group using the attendance register of each class. The ethical clearance was obtained from the institutional ethical committee of VS Dental College and Hospital, Bangalore before conducting the study. The study was conducted during December 2009 – March 2010. Monthly schedule of the survey was prepared well in advance and the concerned authorities were informed regarding examination place, date and timings. On an average 40-60 subjects were examined and interviewed on each day. Two examiners were trained and calibrated by clinically well experienced Head of the Department (HOD), to ensure uniform interpretation by the examiners for the various diseases and conditions to be observed and recorded. The intra and inter examiner reliability was found to be Kappa = 0.85 and 0.80 respectively. A pilot study was conducted on 60 students of government school, to assess the validity of questions in the designed proforma and necessary modification were made in the questionnaire for effective communication. Informed consent from each subject's parents was taken after explaining the nature of the study. The data was collected by using a W.H.O. 1997 oral health assessment form to assess the oral health status of the children, the criteria and the recording instructions used for the survey followed those stated in the manual "Oral Health Surveys" Basic Methods, 4<sup>th</sup> edition (W.H.O.1997).<sup>8</sup>The following instruments and supplies were used for the study: Plane mouth mirror, Tweezers, CPI probe, Mouth mask, Gloves, Chemical disinfectant (Savlon), Sterile cotton, Kidney tray, Soap, Towels, Survey Proforma, WHO oral health assessment form. Examination was done in an open area under natural light, if school does not have the open area or corridor it

was conducted in room using artificial light. The examination area was arranged in such a way that the school children were not permitted to crowd around the examiner or recorder. Adequate number of sterilized instruments and survey proforma was made available during the study current recommendations and standards given by Centre for Disease Control (CDC)<sup>9</sup> were followed for infection control.

### STATISTICAL ANALYSIS

The data was entered into the computer (MS-office, Excel) and was subjected to statistical analysis using the statistical package- SPSS version 13. From the collected data, the frequency, percentages were calculated. The descriptive statistics of the key variables were reported.  $p < 0.05$  was considered as statistically significant.

### RESULTS

Among the total number of subjects (n=1080), there were 155 (14.4%), 153 (14.2%), 154

(14.3%), 156 (14.4%), 154 (14.3%), 155 (14.4%), and 153 (14.2%) students belonged to 6, 7, 8, 9, 10, 11, and 12 years age group respectively, among them 540 (50%) were males and 540 (50%) were females. The study population was equally distributed over gender. In the study among total population (n=1080), 960 (88.9%) were Hindus, 117 (10.8%) were Muslims, and 3 (0.3%) were Christians, among them 871 (80.6%) were residing in urban areas, 125 (11.6%) were residing in peri-urban areas, and 84 (7.8%) were residing in rural area. The oral health status of the study population using WHO 1997 oral health assessment form revealed that 2 (0.19%) had oral mucosal lesions, 33 (3.06%) had enamel opacities/hypoplasia, 80 (7.42%) had dental fluorosis, 114 (10.39%) were suffering from periodontal health problem, 631 (58.53%) were suffering from dental caries. The Dental Aesthetics Index, recommended by the WHO was used to report malocclusion. There were only 2.14% of subjects who had malocclusion (Table 1 & Fig 1).

**Table 1: Distribution of the study subjects according to oral health status**

Parameter	Present		Absent	
	n	%	n	%
Clinical Assessment (extra oral)	0	0.00%	1080	100.00%
TMJ-Symptoms	0	0.00%	1080	100.00%
TMJ-Signs	0	0.00%	1080	100.00%
Oral Mucosa	2	0.19%	1078	99.81%
Enamel Opacities/Hypoplasia	33	3.06%	1047	96.94%
Dental Fluorosis	80	7.42%	1000	92.58%
Calculus and Gingival diseases	114	10.39%	968	89.61%
Dentition Status	631	58.53%	449	41.47%
Treatment Needs	633	58.72%	447	41.28%
Prosthetic Need	0	0.00%	1080	100.00%
Malocclusion	23	2.14%	1057	97.86%

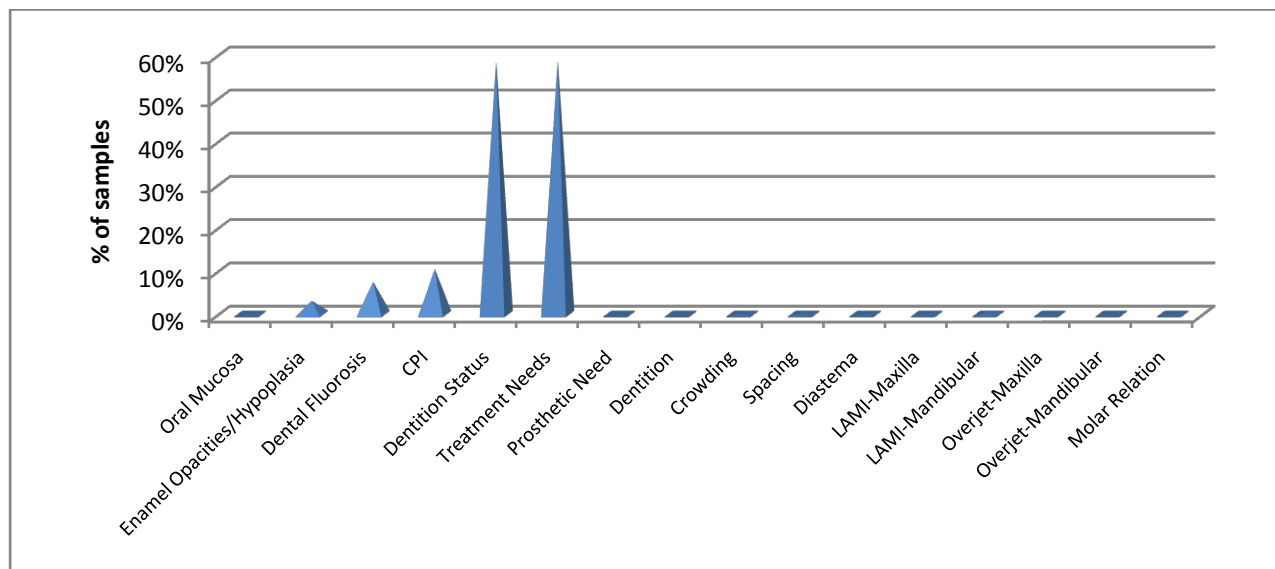
### DISCUSSION

Health is a universal human need across all cultures and age groups. It has been established beyond doubt that optimal health cannot be attained or maintained independent of oral health. The ability to chew and swallow is a critical function required to obtain essential nutrients for the body – the building blocks of general health. However millions of children suffer from dental

caries and periodontal diseases, these untreated oral diseases frequently lead to serious general health problems, unnecessary pain, difficulty in speaking and eating, and lost school time.<sup>3</sup>In the present study government schools were selected. Such schools in addition to catering to children of lower socioeconomic strata offer certain administrative advantages and a favourable frame

work for development and implementation of health programmes. In the present study 3.06% was the prevalence of enamel opacities when comprehensive oral compared to 21.8% of enamel defects in a study conducted in Malaysia.<sup>10</sup>

**Figure 1: Distribution of the study subjects according to oral health status**



In the present study 10.39% of subjects were suffering from the periodontal disease, marked by calculus and gingival bleeding. Similar results were found in a study conducted by UM Das et.al.<sup>11</sup>, in which approximately 9% of 12 years subjects were having calculus. A study by Sharma A et al. observed gingival bleeding was in 76.8% and 75.9%, calculus in 10.2% and 18.3% in 5-8 and 9-12 years age group, respectively.<sup>12</sup> A study by Prasad MG found the prevalence of periodontal conditions was 13.6%.<sup>13</sup> A study conducted by Sharma S et al. showed that the prevalence of gingivitis was 53.4%.<sup>6</sup> Gingival bleeding on probing was observed among 13.76% and 30.0% of 5 year and 12 year old children respectively, whereas calculus was observed among 2.73% and 18.75% respectively in a study by Kumar SA.<sup>14</sup> Periodontal diseases like calculus, bleeding gums and poor oral hygiene were observed in 54%, 8% and 72% of government school children respectively in Karachi.<sup>15</sup> A study by Nik-Hussain NN et al. showed 8.6% had bleeding gingiva and 55.1% had calculus.<sup>10</sup> A study by Jipa IT et al. showed that 32.8% of children had gingival bleeding.<sup>16</sup> In the present study 58.53% had dental caries. The subjects were clinically assessed for their needs for both preventive and treatment care, based on their caries experience and dentition status. Preventive-care need included caries-arresting care and fissure-sealing. Treatment need

included the need for one-, two- or more surface fillings, extractions of teeth, pulp care for 58.72% subjects. This is comparable to the data from National Oral Health Survey and Fluoride Mapping, India<sup>2</sup> where 50.0% of 5 years old and 52.5% of 12 years old individuals were suffering from dental caries. A study by UM Das et.al.<sup>11</sup> also showed similar results in which 57% of 6 years and 49% of 12 years children were suffering from dental caries. The dental fluorosis was affecting 7.42% of study subjects. A study by Sukhabogi JR et al. showed that mean decayed missing filled teeth were higher among government school children compared with private school children.<sup>17</sup> A study by Shailee F et. Al showed that prevalence of dental caries was 32.6% and 42.2% at 12 and 15 years, respectively; at both ages, mean of decayed teeth was statistically higher in government schools as compared with private schools.<sup>18</sup> Another study by Sharma A et al. found the caries prevalence of subjects was 58.4%.<sup>12</sup> A study by Prasad MG found the prevalence of dental caries as 63.5%.<sup>13</sup> A study conducted in Meerut showed that the prevalence of dental caries was 60.1%.<sup>6</sup> A study by Kumar SA showed that prevalence of dental caries was 68.5% among 5 year old children and 30.5% among 12 year old children.<sup>14</sup> Dental caries prevalence among school children of Nepal was found to be 52% and 41% in 5-6 year olds and 12-13 year olds respectively.<sup>19</sup> A

study by Jipa IT et al. showed that the prevalence of caries was 67.1%.<sup>16</sup>The government school children in Karachi showed that prevalence of dental decay was 61%.<sup>15</sup>A study by Nik-Hussain NN et al. showed prevalence of dental caries as 75.5% among 16 year old school children in Malaysia.<sup>10</sup> A study conducted by Simon C et al. stated that the prevalence of dental caries was 21.1% among school children of Addis Ababa.<sup>20</sup>The Dental Aesthetics Index, recommended by the WHO was used to report malocclusion. There were only 2.14% of subjects who had malocclusion. Malocclusion mainly results from an unfavourable tooth and bone ratio, which may be hereditary or have congenital causes. It also results from childhood habits such as thumb sucking and tongue thrusting or mouth breathing. Early exfoliation of primary teeth, nutritional deficiencies and other causes also may account for some forms of malocclusion. A study by Prasad MG found the prevalence of malocclusion as 25.1%.<sup>13</sup>A study conducted by Simon C et al. stated that the prevalence of malocclusion was 23.7%.<sup>20</sup>The current study showed that the prevalence of dental fluorosis was 7.42%. A study by Kumar SA showed that 7.5% of 12 year olds had dental fluorosis.<sup>14</sup>A study by Jipa IT et al. 19.5% of children had fluorosis.<sup>16</sup>A study conducted by Simon C et al. found the prevalence as 1.6%.<sup>20</sup>The cross - sectional nature of the present study limits the determination of a true age difference in regard to oral health status. Differences in age groups or cohort can be described, but the differences cannot be definitively explained. This necessitates a longitudinal study

### RECOMMENDATIONS

- More public funded preventive programmes are required to improve the oral health of these children
- Government should provide some means of facilities to these lower socioeconomic children to have a better access to the dental treatment care.
- The Ministry of Health should provide in-service training for teachers, school staff, and parents on how to promote good oral health. Oral health should be an integral part of social care planning.
- A strong lobby should be formed by the oral health professional through Indian Dental Association and advisory director to address to the needs of this group of subjects and gain government attention.

- The oral health situation of this population must be improved and suitable system devised for delivery of preventive measures.
- Regular school-based programmes of tooth brushing should be implemented and reinforced.
- Healthy eating policies should be promoted in these schools. There is a clear need to involve the dental profession more actively in dietary counselling and provision of preventive oral health care and treatment.
- Dental Colleges also should take responsibility of a geographical area to implement the oral health programmes and upgrade their training, research and services in the community.

### CONCLUSION

In the present study more than half of the study subjects were suffering from oral diseases, like dental caries and they require treatment intervention.

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**Source of support:** Nil

**Conflict of interest:** None declared

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