

## Original Research Article

# Oral health status treatment needs among 12 years old children living in orphanages and parental homes in Bangalore city: a cross sectional study

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## ABSTRACT

**Background:** Enjoying good oral health includes more than just having healthy teeth. Many children have inadequate oral and general health because of active and uncontrolled caries. In orphans the oral hygiene practices are usually neglected which may affect various aspects of life, including function, appearance, interpersonal relationships and even career opportunities. Aim of study was to assess oral health status, treatment needs among 12 years old children living in orphanages and compare with that of children living in parental homes and attending government school.

**Methods:** A descriptive cross sectional comparative study was carried out among 460 twelve year old children living in orphanages and parental home. Oral health status and treatment needs was assessed using the World health Organization's oral health assessment (tooth surface) form for children- 2013. Proportion was calculated using chi-square test and T-test.

**Results:** Present study found mean decayed surface, mean missing surface and mean filled surface was higher in orphanage children ( $4.57 \pm 3.9$ ), ( $0.17 \pm 0.91$ ) and ( $3.2 \pm 0.37$ ) and as compared to school children i.e. ( $3.88 \pm 3.91$ ), ( $0.16 \pm 0.370$ ) and ( $2.3 \pm 0.14$ ). 68.7% school children required prompt treatment (including scaling) 24.3% required immediate treatment due to pain or infection of dental and oral origin, 5.7% required preventive or routine treatment.

**Conclusions:** The study highlighted untreated caries, less filled component and high missing component among orphanage children compared to school children. There is need for dental care, primary prevention such as oral health education programmes in schools.

**Keywords:** DMFT/S, Orphanages, Parental home, Treatment needs, WHO

## INTRODUCTION

Oral health is an integral part of general health. It is important for appearance, sense of well being and also for overall health and oral health can affect quality of life directly and has been linked to behavioral and developmental problems in children. Oral health may be defined as a standard of health of the oral and related

tissues which enables an individual to eat, speak and socialize without active disease, discomfort or embarrassment and which contributes to general wellbeing and oral health of children is important towards their overall wellbeing.<sup>1</sup>

Despite great improvements in the oral health of population in several countries, the global problems still

persists. This is particularly so among underprivileged groups in both developing and developed countries. Although enjoying good oral health includes more than just having healthy teeth, many children have inadequate oral and general health because of active and uncontrolled caries.<sup>2</sup>

According to child developmental psychology children have the ability to make evaluative judgments of their appearance, the quality of friendships and other peoples thoughts, emotions and behaviors gradually develops through middle age and by age 11 or 12, they view as multidimensional concept organized around the following constructs: being functional, adhering to good life style behaviors a general sense of wellbeing and relationships with others.<sup>3</sup>

An orphan is defined as a child under 18 years who has lost his father, mother or both parents. Orphans, therefore, are considered disadvantaged and socially marginalized population whom diseases burden is high. Poor living conditions in orphanages where children live might be related to many complex health problems. Regarding oral health, children in orphanages revealed a high prevalence of dental caries, dental trauma and gingivitis. This has been attributed to overcrowding; lack of adequate staff, poor oral health practices, psychological stress and improper dietary habits.<sup>4</sup>

Oral disease patterns are dependent on various socio economic characteristics of the children and parents. It has been that the pattern of oral disease and quality of life would be different among children living with their parents and the children residing in orphanages.<sup>5</sup> Orphans get little health care and oral cavity is the most neglected aspect, oral diseases seriously impair the quality of life, they may affect various aspects of life, including function, appearance, interpersonal relationships and even career opportunities.<sup>6</sup> Oral health and general wellbeing are inextricably bound to each other. If the oral health of children develops unfavorably, they should be considered a risk group demanding special attention for planning dental health program.<sup>7</sup>

Literature comparing the oral health status, treatment needs and socio behavioral risk factors among children staying in orphanages with that of children living in parental homes is very sparse; therefore this study is was carried out in Bangalore city.

## METHODS

A descriptive cross-sectional comparative survey was conducted to assess the oral health status and treatment needs among 12 year old children living in orphanages and compare with children living in parental homes in Bangalore city, Karnataka, India. Ethical clearance was taken from Institution Review Board. The study was done for a duration of 6 months from March 2022 to August 2022.

## Data collection

To assess the oral health status and treatment needs WHO oral health assessment forms for children (tooth surface) (2013) was used.<sup>8</sup>

Children aged 12year old living with parents and attending government school and children's living in orphanages and who were willing to participate and gave assent were included in the study. Children absent on the day of survey and who were non cooperative due to their physical and mental disability and children with compromised medical status were excluded from the study.

## Sample size

The survey population comprised all 12 years old children from the selected government schools and orphanages of Bangalore city, combination of Multistage & cluster sampling technique was done to select schools and orphanages. A total sample size of 460 was obtained.

Sampling frames of orphanages run by NGO's (as per the list obtained from the 'District Child protection Unit, Bengaluru) and government primary and higher primary schools (list obtained from Karnataka school education. "DPI" website) was used for selecting orphanages and government schools. <http://www.schooleducation.kar.nic.in/SchoolSearch/PSschlistdisp.asp>

Bangalore city is divided into two zones i.e. Bangalore North zone, and Bangalore South zone. The first stage Random sampling was done among these zones to identify one study zone. Further a second stage Random sampling was done within the obtained study district to obtain the study zone. Government schools and orphanages, from the concerned administrative wards within the study zone was selected using simple random sampling technique and all 12 years old children from the selected orphanages and government school were allowed to participate.

## Oral examination procedure

The schools and orphanages were visited during the scheduled days at the appointed time. The examination was carried out in the respective school and orphanages. Permission from respected authorities concerned was obtained before the study was conducted. All the students were briefed about the study and examination procedure. Assent (informed consent) was obtained from the children prior to their participation in the survey.

A single investigator conducted all examinations, assisted by a trained recording assistant. The examination for dental caries was done with the help of a sterile mouth mirror and explorer. The caries experience and treatment needs was assessed using the DMF(S) criteria according to WHO proforma for children 2013.<sup>8</sup> Periodontal status,

dental fluorosis, trauma, erosion, oral and mucosal conditions was recorded as presence and absence using WHO proforma for children 2013.<sup>8</sup>

### Statistical analysis

All statistical analysis was done using SPSS 20. Proportions were calculated using Chi Square test and T test. P Value less than 0.05 were considered as statistically significant.

## RESULTS

Mean decayed surfaces of orphanage children were higher- ( $4.57 \pm 3.9$ ) as compared to school children. Similarly, missing surfaces were higher in orphanage ( $0.17 \pm 0.91$ ) as compared to school children ( $0.16 \pm 0.37$ ). Statistically significant difference was found for decay surfaces ( $p=0.002$ ) and filled surfaces ( $p=0.018$ ) with mean difference of -3.06 and -0.09 respectively (Table 1).

**Table 1: Comparison of the groups based on DMF (S).**

| DMFS             | Min |   | Maxi |    | Mean |      | Mean deviation | P value |
|------------------|-----|---|------|----|------|------|----------------|---------|
|                  | S   | O | S    | O  | S    | O    |                |         |
| Decay surfaces   | 0   | 0 | 9    | 14 | 3.88 | 4.57 | -0.691         | 0.02    |
| Missing surfaces | 0   | 0 | 1    | 6  | 0.16 | 0.17 | -0.004         | 0.9     |
| Filled surfaces  | 0   | 0 | 9    | 13 | 2.3  | 3.2  | -0.09          | 0.01    |

**Table 2: Distribution of the subjects based on fluorosis.**

| Groups          | Types        | Frequency | Percent | Chi-square value | P value |
|-----------------|--------------|-----------|---------|------------------|---------|
| School children | Normal       | 189       | 82.2    | 2.07             | 0.35    |
|                 | Questionable | 34        | 14.8    |                  |         |
|                 | Very mild    | 7         | 3.0     |                  |         |
|                 | Total        | 230       | 100.0   |                  |         |
| Orphanages      | Normal       | 192       | 83.5    |                  |         |
|                 | Questionable | 32        | 13.9    |                  |         |
|                 | Very mild    | 6         | 2.6     |                  |         |
|                 | Total        | 230       | 100.0   |                  |         |

**Table 3: Distribution of the subjects based on condition of oral mucosal lesions.**

| Groups          | Options               | Frequency | Percent | Chi-square value | P value |
|-----------------|-----------------------|-----------|---------|------------------|---------|
| School children | No abnormal condition | 213       | 92.6    | 0.13             | 0.71    |
|                 | Ulceration            | 17        | 7.4     |                  |         |
|                 | Total                 | 230       | 100.0   |                  |         |
|                 | No abnormal condition | 215       | 93.5    |                  |         |
| Orphanage       | Ulceration            | 15        | 6.5     |                  |         |
|                 | Total                 | 230       | 100.0   |                  |         |

Out of 230 (100%) school children, 34 (14.8%) had questionable type of fluorosis; 7 (3%) had very mild type of fluorosis whereas questionable type of fluorosis was seen in 32 (13.9%) orphanage children with 6 (2.6%) children presented with very mild type of fluorosis. Chi-square test no showed statistical significant association ( $\chi^2=2.07$ ;  $p=0.35$ ) between school children and orphanage (Table 2).

No sign of erosion was seen in 95.2% ( $n=219$ ) school children with 4.3% ( $n=10$ ) had enamel lesion and 0.4% (1) had dentinal lesion. Similarly no sign of erosion was seen in 95.7% ( $n=220$ ) orphanages and 3.9% ( $n=9$ ) showed enamel lesion and 0.4% ( $n=1$ ) had dentinal lesion. Chi-square test showed no statistical significant

association ( $\chi^2=0.05$ ;  $p=0.9$ ) between school children and orphanage.

Maximum school children had no sign of injury-96.1% ( $n=221$ ) with 1.7% ( $n=4$ ) had treated injury; 0.9% ( $n=2$ ) having enamel fracture; 0.4% ( $n=1$ ) having enamel and dentin fracture; 0.9% ( $n=2$ ) had missing tooth due to trauma. Almost Similar results were seen in orphanages with 96.5% ( $n=222$ ) having no sign of injury; 1.3% ( $n=3$ ) had treated injury; 0.9% ( $n=2$ ) had enamel fracture; 0.4% ( $n=1$ ) having enamel and dentin fracture; 0.9% ( $n=2$ ) having missing tooth due to trauma. Chi-square test showed no statistical significant association ( $\chi^2=0.14$ ;  $p=0.99$ ) between school children and orphanage.

Ulceration was seen in 7.4% (n=17) school children and in 6.5% (n=15) orphanage children. Chi-square test showed no statistical significant association ( $\chi^2=0.13$ ;  $p=0.71$ ) between school children and orphanage. Maximum ulceration was seen in lips-3.5% (n=8) out of

230 school children followed by buccal mucosa- 2.2% (n=5). Similar results were seen in orphanage with maximum ulceration on lips-3% (n=7) followed by ulceration on buccal mucosa 1.7 % (n=4) (Table 3).

**Table 4: Distribution of the subjects base on intervention urgency.**

| Groups          |                                        | Frequency | Percent |
|-----------------|----------------------------------------|-----------|---------|
| School children | No curative treatment                  | 3         | 1.3     |
|                 | Preventive or routine treatment needed | 13        | 5.7     |
|                 | Prompt treatment                       | 158       | 68.7    |
|                 | Immediate treatment                    | 56        | 24.3    |
|                 | Total                                  | 230       | 100.0   |
| Orphanage       | No curative treatment                  | 9         | 3.9     |
|                 | Preventive or routine treatment needed | 33        | 14.34   |
|                 | Prompt treatment                       | 139       | 60.434  |
|                 | Immediate treatment                    | 49        | 21.3    |
|                 | Total                                  | 230       | 100.0   |

Among school children, 68.7% (n=158) school children required prompt treatment; 24.3% (n=54) required immediate treatment; 5.7% (n=13) required preventive or routine treatment and only 1.3% (n=3) required no curative treatment. Similarly, among orphanage 60.434% (n=139) required prompt treatment; 21.3% (n=49) required immediate treatment; 21.3% (n=49) required preventive or routine treatment and only 3.9% (n=9) required no curative treatment.

## DISCUSSION

Untreated oral diseases in children lead to serious general health problems, significant pain and interference with eating and lost school time.<sup>9</sup> One of the factors to be considered when planning for the required growth in dental care facilities is the prevalence of dental diseases and their treatment needs in the population.<sup>9</sup> Present study considered 12-year age group as it is the global monitoring age for dental caries, for international comparisons and monitoring of disease trends.

Present study found mean decayed surface, mean missing surface and mean filled surface was higher in orphanage children ( $4.57\pm3.9$ ), ( $0.17\pm0.91$ ) and ( $3.2\pm0.37$ ) and as compared to school children i.e. ( $3.88\pm3.91$ ), ( $0.16\pm0.370$ ) and ( $2.3\pm0.14$ ). Similar study conducted by Goyal et al in Udaipur had similar results where the children without parents were having slightly higher caries experience as compared to those having parents.<sup>3</sup> The mean decayed component was found to be ( $1.33\pm1.2$ ) for children with parents as compared to ( $1.44\pm1.4$ ) of those without parents, The mean missing component was found to be ( $0.15\pm0.48$ ) for children with parents 0.00 for those without parents.<sup>3</sup> This study found dental caries experience was slightly more among orphanage children this may be due to low utilization of preventive or therapeutic oral health services and it can also be related

to fact that orphanage usually taken care by NGO's or social workers who may not be aware or may be due to lack of knowledge about the importance of oral health which is an integral part of children wellbeing.<sup>5</sup>

Very few participants in the present study had fluorosis which was of mild type in both school children and orphanage children. Which was deferring from study the conducted by Naidu et al among private and government school students' majority had mild and moderate forms (21.5% and 22.1% respectively) and 6.9% had severe form of dental fluorosis.<sup>10</sup> Fluorosis of teeth is influenced by factors such as diet and water is the main source of fluoride. The WHO standards for fluoride in drinking water are 1-1.5pp. The mild fluorosis seen in our study shows that the fluoride consumption from all the sources was according to WHO status.

About 1.7% of both the study participants had trauma in either one or two teeth. In (2008), Glendor study reported that 25% of all school children experience dental trauma with most of these injuries before age nineteen.<sup>11</sup> Providing proper knowledge and education to school teachers and caregivers about dental trauma can help them in decision making dental trauma. The less prevalence of dental trauma as compared to other studies may be due to the increase awareness among parents, teachers and children about treatment with injuries.

Among oro-mucosal lesions school children 7.4% and 6.5% orphanage children had ulceration oneither on lips or buccal mucosa which was found in accordance with the study conducted by Arpita et al most common soft tissue lesion among orphanage children and school was apthousulcer (30%).<sup>5</sup>

In the present study 68.7% school children required prompt treatment (including scaling) 24.3% required

immediate treatment due to pain or infection of dental and oral origin, 5.7% required preventive or routine treatment. Among orphanage children 60.434% required prompt treatment; 21.3% required immediate treatment; 6.1% required preventive or routine treatment when compared with the study conducted by Moses et al among 5-15 year old school going children in chidabaram.<sup>9</sup> Highest treatment needs for 12 year old children was restoration followed by pulp care. In the study conducted by Haddad et al among school children of Yemeni majority of the students required restorative treatment (84%) followed by 37% needed extraction, 19% needed preventive treatment.<sup>12</sup> The limitation of this study was small sample size.

It can be said from the above that childhood circumstances, socio economic position, family structure and parenting, influences psychological and psychosocial attributes of a child, and these in turn influences oral health outcome in terms of the social impact of dental disease.

## CONCLUSION

The findings of the clinical examination highlighted untreated caries, less filled component and missing component among orphanage children compared to school children. This may be attributed to poverty, illiteracy, poor awareness and lack of oral health services. To improve the oral health status a combined strategy that deals with current disease load and helps to prevent the further occurrence of disease in the long run is needed. Resources of the dental colleges can be utilized for providing prevention oriented dental care for underprivileged children.

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