

Assessment of oral health status of street children in Delhi, India

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ARTICLE INFO



Keywords:

oral health , street children, oral hygiene practices, dental caries, periodontal diseases

ABSTRACT

Context: Street children are considered to be a high risk group for dental diseases especially dental caries and periodontal diseases.

Objective: Assessment of oral health status and oral hygiene practices of street children in Delhi, India

Methods: A cross sectional exploratory study was conducted on 583 institutionalized street children residing/visiting eight shelter homes across Delhi. Duration of data collection was two months. WHO oral health assessment form 2013 was used for recording oral health status of these children. Statistical analysis was done using SPSS -17.

Results: In total 583 street children of the age group 5-15 years were examined, out of which 340 were males and 243 females. Dental caries prevalence ranged from 20% in primary dentition to 36.5% in permanent teeth. Mean caries experience in these children ranges from 0.53 to 0.91. Periodontal conditions were more severe as majority of them were suffering from bleeding gums or calculus deposits on their teeth. Dental fluorosis was also observed in 15% of the subjects.

Conclusion: Oral health status of the examined street children was quiet poor especially the periodontal (gingival) condition. Reasons for such findings can be lack of awareness regarding dental problems and financial constraints to afford oral hygiene aids and timely dental treatment.

Introduction

UNICEF defines a street child as, “any girl or boy for whom the street (in the widest sense of the word, including unoccupied dwellings, wasteland, etc.) has become his or her habitual abode and/or source of livelihood; and who is inadequately protected, supervised, or directed by responsible adults”.¹ There are social and institutional factors that serve to sustain their presence. They are result of increasing poverty and unemployment, increased migration of families, broken families, neglect, abuse and violence, armed conflicts, natural and manmade disaster, decreasing resources in rural areas and the attraction of cities.²

Poor health is a chronic problem for street children. Half of all children in India are malnourished, but for street children the proportion is much higher. Street

children live and work amidst trash, animals and open sewers. Not only are they exposed and susceptible to disease, they are also unlikely to be vaccinated or receive medical treatment.³

Estimated number of street children ranges from 10 to 100 million, the majority being located in major urban areas of developing countries. By regions, estimates have included about 40 million in Latin America, 25-30 million in Asia, and over 10 million in Africa. Boys predominate (71-97%), but girls often have more difficulties.² Overall, estimates for the total number of street children in India range from 400,000-800,000. According to a study, there are around 51000 children living on the streets of Delhi.⁴ Many Non Government Organizations are actively involved in improving the quality of life of street children. These organizations

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have build homes for these children where they are provided food and shelter. These NGOs also helps in enrolment of these children into schools to bring them into mainstream.

In India , there are research studies on general health status of street children which may or may not include oral health a part of it. Studies on the oral health status of street children are scarce. Limited studies have been done to assess dental health of institutionalized street children in India and around the world. Majority of these studies have concentrated on one or two aspects of oral health while assessing oral health status of this group of children. A detail picture of oral health status of these children is important when planning for a comprehensive dental programme for them as well as for lobbying efforts with health authorities. Keeping above facts in mind an oral health survey was designed utilizing WHO oral health assessment form, 2013 ⁵ which will provide us a full picture of oral health status of street children in the age bracket of 5-15 years attending various special schools in Delhi.

Materials and method

A cross sectional descriptive survey was conducted among 583 street children of 5-15 years of age group residing/visiting different institutions across Delhi state in India.

Survey Groups and Sample Size

Based on study conducted in Delhi on street children, there are around 51000 street children in Delhi state alone. There was no study available where prevalence of dental diseases was measured in these children in Delhi, therefore, based on results from pilot study and previous studies done on school children in the state, the prevalence of caries is around 50%. Hence, the calculated sample size is 381 at 95% confidence

interval and 80% power of the study (Statcalc, Epiinfo version-7).

Ethical clearance and informed consent

Informed consent was obtained from parent/ guardians and permission had been taken from respective school authority prior to the clinical examination of children. Ethical clearance was obtained from the Ethical Research Committee of Jamia Millia Islamia University, New Delhi. In total eight institutions located in various part of Delhi gave their consent to participate in the study.

Training and calibration of examiners

Clinical data was collected by two examiners. A recording clerk also assisted during the process. Before starting the main survey, a pilot study was conducted on 30 street children for the purpose of training and calibration of examiners and estimation of sample size. Cohen's Kappa coefficient for assessment of dental caries was 0.80, indicating a good inter examiner reliability.

Inclusion and exclusion criteria

Children present on the day of examination were included in the study. A second visit was made to examine absentees. Those who are not willing to participate or unwell were excluded. Data was collected over a period of two months.

Data recording

Dental examinations were held in the respective schools under natural light with sufficient illumination with participants seated in the ordinary chair. Examination was carried out using mouth mirror and CPI probe. Help of Teachers/care taker were utilized for communication with the children.

WHO Oral Health Assessment Form (2013) for children's was used for recording oral health status of the subjects. Information collected through this form

included general information pertaining to study subjects like Name, Date of Birth, Age, Gender. Clinical assessment includes recording of oral mucosal lesions, dentition status of child for caries and its effect like missing or filled teeth due to caries, Periodontal status and presence and severity of Dental fluorosis.

A tooth was classified as missing if it had not erupted after six months of its expected eruption date. A tooth was classified as retained if it was still in the arch after six months of its expected date of exfoliation.

After the examination children in need of dental treatment were provided basic dental treatment like oral prophylaxis and restorations at their institutions itself in mobile dental clinic and they were referred to the dental hospital for rendering specialty care wherever required.

Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS), version 17 (IBM Software Company, USA). Epiinfo version 7 was used for calculating the sample size. Frequency tables were prepared and mean and standard deviation were calculated. Statistical significance was set at $P \leq 0.05$.

Results

This observational study was conducted on 583 street children, out of which 340 were males and 243 females. The age bracket ranged from 5 to 15 years. When inquired about their oral hygiene practices, majority of them were using toothbrush and toothpaste (79%) as shown in graph-1. Half of the subjects who were using toothbrush and paste for cleaning teeth were using horizontal technique of toothbrushing (graph-2).

Enamel hypoplasia was observed in 211 (36.1%) subjects. Its prevalence was more in males than females, although not statistical difference was

present. (Table-1) Dental fluorosis –a type of enamel hypoplasia caused by excess of fluoride in drinking water (>2ppm) was seen in 79 children. Most of them were suffering from moderate to severe fluorosis as per Dean's index. (graph-3)

Mean def and DMF were calculated for caries experience in primary and permanent teeth respectively are shown table-2. Overall caries prevalence ranged from 20% in primary dentition to 36.5% in permanent teeth. There was no statistical difference in caries experience between two genders.

Periodontal disease status of sample population was measured using CPI index. Code-2 (presence of calculus or other plaque retentive factors) of CPI index was most dominating with prevalence of 59.3% followed by code-1 (gingival bleeding on probing). The mean number of sextant with highest code was also calculated, again code-2 had the highest mean of 2.67 (Table-3).

Discussion

Oral health is an integral part of general health and well being. Street children have equal right for good oral health as any other citizen of the country. Unfortunately due to their condition and lack of awareness towards oral health, dental diseases get undiagnosed in these children leading to accumulation of high unmet demand for dental care later in life.

Dental caries is a rapidly emerging oral health problem amongst the children of India. According to a National Oral Health Survey conducted in 2003-4, caries prevalence in India was 51.9, 53.8 and 63.1% at ages 5, 12 and 15 years, and mean DMF values were 2, 1.8 and 2.3 respectively. ⁶As per WHO Oral Health report (2003), mean DMF among 12 year children in Indian population was in range of 1.2-2.6. ⁷

The mean caries experience was ranged from 0.53-0.91 in these children. This is less than the national average but comparable to studies conducted by Srinivas R et al⁸ and Rao SV.⁹ Reason for low prevalence could be comparatively less exposure to cariogenic diet due to their poor socio economic condition.⁹ Caries was affecting 20% of deciduous teeth and 36.5% permanent teeth.

Periodontal conditions like gingival bleeding, calculus presence were more common in these children as compared to dental caries as almost everyone was suffering from either of one. These observations are similar to studies done by Srinivas R et al,⁸ Rao SV⁹ and Chi D et al.¹⁰ Plaque accumulation is causing gingivitis and calculus accumulation in these children. This accumulation is occurring due to neglected oral hygiene because of lack of awareness regarding oral hygiene and improper brushing techniques.

Conclusions and recommendations

The level of treatment or care by the society of its neglected and dependent part determines its cultural level and evolution. Street Children deserve special attention in the area of oral health as reflected in this study. Incharges and teachers who are involved in taking care and training of these children must be educated about various aspects of oral health maintenance like regular visit to dentist, proper brushing, self evaluation, importance of brushing with fluoridated toothpaste.

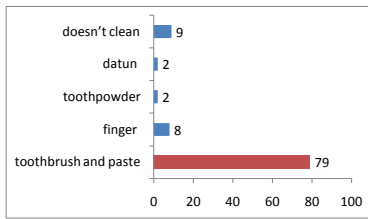
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Source of Support: Nil Conflict of Interest: None

Graph -1: Oral hygiene practices of street children



Graph-2: distribution of subjects according to technique of toothbrushing

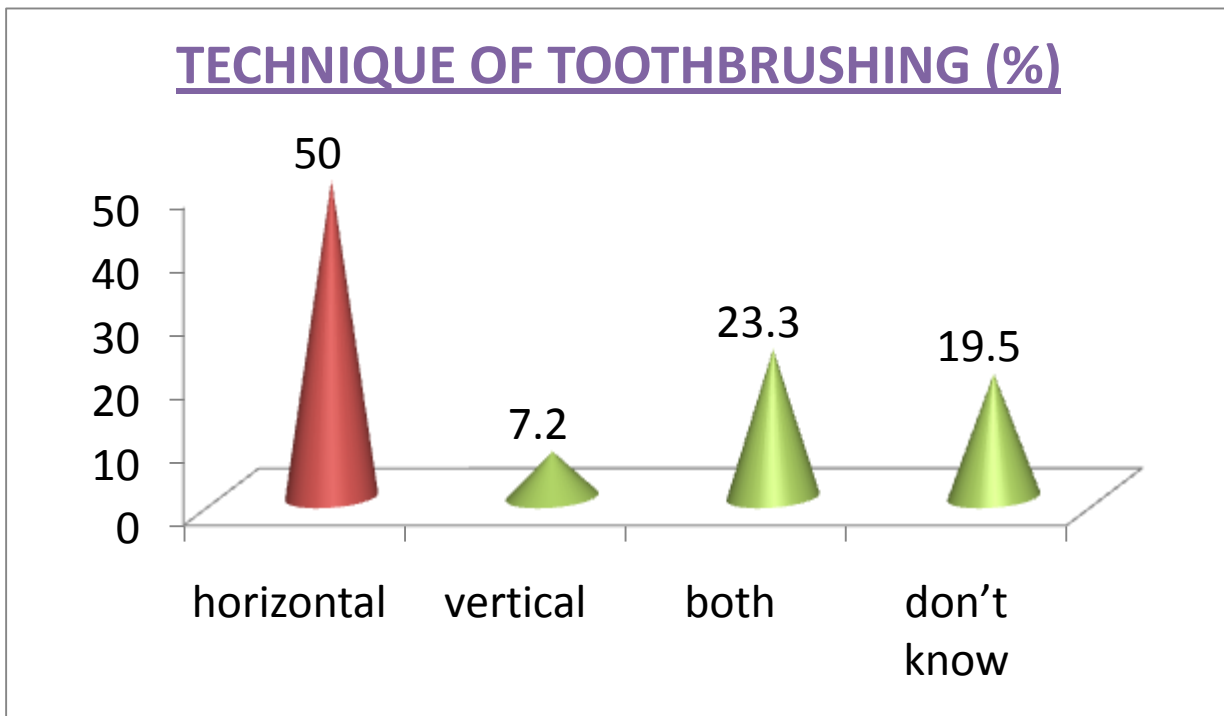


Table-1:Distribution of subjects according to presence or absence of enamel hypoplasia

Enamel hypoplasia	Present	Absent	Total
Male	125	215	340
Female	86	157	243
Total	211(36.1%)	372	583

Chi square, $p > 0.05$

Graph-3: Severity of dental fluorosis in affected children

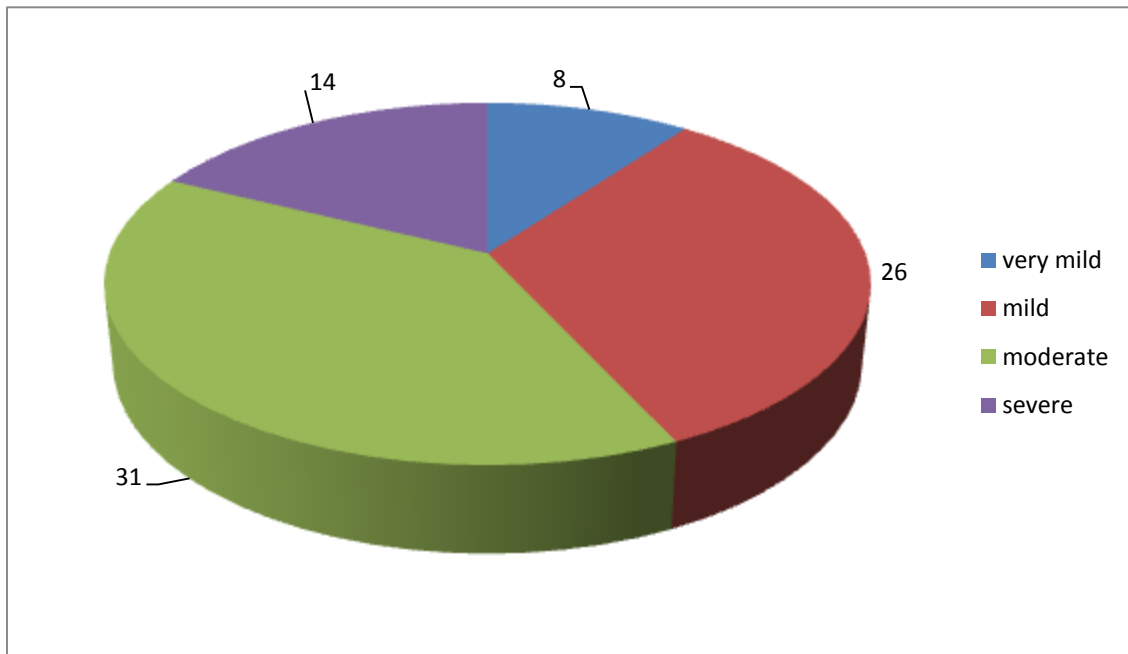


Table-2: Mean caries experience in primary and permanent teeth of males and females

	Mean (total)	Standard deviation	Males	Females
def	0.53	1.3	0.53+/- 1.3	0.53+/- 1.27
DMF	0.91	1.65	0.94+/-1.5	0.86+/-1.7

Chi square, $p > 0.05$

Table-3: Prevalence of CPI index codes and mean number of sextants affected in the subjects

	Code-0	Code-1	Code-2
Prevalence of codes (%)	19.9	20.8	59.3
Mean number of sextants affected	1.01	1.26	2.67