

Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com

doi: 10.21276/jamdsr

ICV 2018= 82.06

(e) ISSN Online: 2321-9599;

(p) ISSN Print: 2348-6805

Original Research

Dental caries and periodontal status among 6-15 yrs aged orphanage children in Patna, Bihar: A cross sectional study

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ABSTRACT:

Context: Orphaned children remain in greater need of health care counseling, general health care, oral health care, as they are socially and economically marginalized. Very few studies have been conducted on the oral health status of orphanage population till date. **Aims:** This study was conducted with an aim to assess the dental caries and periodontal status of Orphanage children belonging to 6-15 years age in Patna, Bihar. **Settings and Design:** A cross-sectional study was conducted among orphanage children aged 6-15 years in Patna, Bihar. The students were categorized into 2 groups, 6-12 years and 13-15 years age group. **Methods and Material:** Dental caries assessment was done by deft/DMFT index and periodontal status was assessed by CPI index as per W.H.O. Oral Health Assessment Form (1997). **Statistical analysis used:** Statistical test was performed using Statistical Package for Social Sciences, Chicago, U.S.A (SPSS Version 21.0). To compare the population, chi square analysis was used. **Results:** A total of 562 students participated in the study. Mean deft for 6-12 years was 3.38 ± 3.10 . Mean DMFT was higher for the 13-15 years age group, i.e. 5.24 ± 3.25 , than that of 6-12 years age group, i.e. 3.42 ± 2.80 . Mean deft and DMFT of males was higher than of females. Prevalence of gingival bleeding, Calculus was higher among 6-12 years age group. **Conclusions:** Orphanage children are high risk group for dental caries and periodontal diseases. Dental Caries and Periodontal disease prevalence were appreciated in the study. Preventive and Curative oral health programs can be recommended with an aim to decrease the existing dental disease burden in orphanages in Patna, Bihar.

Key-words: Orphanage, Dental Caries, Periodontal Diseases, World Health Organization (W.H.O).

Received: 22 July, 2019

Revised: 15 September, 2019

Accepted: 18 September, 2019

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This article may be cited as: Sharma S, Shahi AK, Chandra S, Kumari M, Singh RNP, Singh B. Dental caries and periodontal status among 6-15 yrs aged orphanage children in Patna, Bihar: A cross sectional study. J Adv Med Dent Scie Res 2019;7(10):107-111.

INTRODUCTION:

Oral health is considered as a pivotal part of general health. Poor oral health may lead to poor mental and physical health and is also considered as a determinant of quality of life.¹ According to Sir William Osler; the

oral cavity is the "mirror" of general health. In most cultures, health priority is preferred and is considered as a fundamental right of human being without any discrimination of race, religion or economic and social condition.² Health is considered as a valuable asset for

both individuals as well as for the nation and its progresses if its people live a physically, mentally and socially sound life.³

Oral health problems are more common among populations which have limited access to oral health-care services. This may be due to language barriers, less oral health awareness and oral health facilities, lack of financial sources, trust issues.⁴ Orphaned children are usually socially and economically marginalised and thus remain in greater need of health care counselling, general health care, oral health care.⁵

At present, India is home to 20 million orphans that accounts to 4% of India's children population, most of whom are abandoned and whose parents have died. Eastern India encompassing Bihar, Jharkhand, West Bengal and Odisha has 5.2 million orphans, which is comparatively more than regions of India.⁵ Orphanages that are considered as residential institution, or group home that are dedicated to the care of orphans and other children separated from their biological families, play a significant role in molding the future, by providing safe environment with special emphasis on education, health and skill development.⁶

Unlike other deprived sections of society like blind school children, handicapped children, mentally challenged children, drug abuse children and low-socio-economic status children, less studies have been conducted to assess the dental caries status and oral hygiene status of Orphanage children in India and Bihar. Identification of high risk groups helps in judicious utilization of available resources and prioritizing the oral health services during implementation of institution based oral health programs and policy development. Thus, the present study was conducted to assess the dental caries and periodontal status of Orphanage children belonging to 6-15 years age in Patna, Bihar.

SUBJECTS AND METHODS:

A Descriptive Cross-sectional study was conducted on the Orphanage students in the city of Patna, India. City of Patna has five orphanages and all agreed to participate in the study. Permission from the heads/ Principals was obtained for the conduction of the study. Written Proxy consent for the children subjects was provided by the in-charge teachers/wardens of each institution.

Sample size of the present study was calculated using the formula $n = \frac{Z^2 P(1-P)}{d^2}$ (where n=sample size, Z= Z statistic for a level of confidence, P= prevalence, d= precision). Considering prevalence of Dental Caries as 50 % as obtained in a study conducted on similar population in Mysore, sample size of 562 was obtained.⁷ Inclusion criteria involved full time/ permanent children enrolled in orphanage. Exclusion criteria involved- subjects unwilling to participate in the study, subjects with neurological or systemic diseases, acute pain or with any medically compromised condition that contra-indicates oral examination. Based on the above criteria, out of 602 subjects in the age group 6-15 years of all the designated institutions enrolled for the study, 562 students were taken up for the study. The students

were categorized into 2 groups, 6-12 years and 13-15 years age group.

Demographic data including age, gender, education along with the data on dietary practices was obtained. The data was collected by means of self-administered and structured, close ended questionnaire and a high response rate was obtained prior intra-oral examination. Single examiner conducted the clinical examination. Dental caries assessment was done by deft/DMFT index and Periodontal status was assessed by CPI index as per WHO Oral Health Assessment Form (1997).

The study was conducted in a span of 2 months' time and in the premises of the participating orphanage institutions. American Dental Association Type-3 examination was conducted in institutions on the day of the study. Proper care was taken for sterilization of instruments prior examination. Any case which required immediate treatment observed during examination was informed to the institution authorities and they were advised to seek treatment for the same.

The data obtained was compiled systematically, transformed from a pre-coded proforma to a computer. The total data was distributed meaningfully and presented as individual tables. Statistical test was performed using Statistical Package for Social Sciences, Chicago, U.S.A (SPSS Version 21.0). To compare the population, chi square analysis was used. The level of significance was set at 5% ($p < 0.05$) for all the observations.

RESULTS:

Total of 562 students of orphanage participated in the study. The orphanage students were classified based on their age into 2 groups, 6-12 years and 13-15 years age group. Majority of the students 365 (64.95 %) were from 6-12 years of age whereas lower number of subjects 197 (35.05 %) were from 13-15 years age group. A statistically significant difference was observed among the group ($p < 0.001$) (Table 1).

Based on dietary patterns, 297 (52.85%) of the subjects belonged to mixed diet whereas 265 (47.15%) subjects belonged to vegetarian diet (Table 2).

It was found that 220 subjects (39.14%) had healthy gingiva (Score 0), 179 (31.85%) individuals had bleeding gums (Score 1), 154(27.40%) individuals had calculus (Score 2) over teeth, 6 (1.07%) had pockets of range 4-5 mm (Score 3), 3(0.54%) had pockets of depth 6mm or more (Score 4). Age group between 6-12 years, had more individuals with healthy gingiva in comparison to the other group. A statistically significant difference was observed among the groups ($p < 0.001$) (Table 3). Bleeding (Score 1) was most common among the age group between 6-12 years, which had most number of individuals, i.e. 109 (29.86%) affected. Calculus (Score 2) was most common among the age group between 6-12 years, which had most number of individuals, i.e. 112 (30.86%) affected and age group 13-15 years, had least 42 (21.31%) individuals with calculus.

The DMFT and deft indices were recorded according to WHO oral health assessment form (1997). deft index was used to record the caries status in primary teeth of

age group 6-12 years. DMFT index was used to record the caries status in permanent teeth from age group of 6-12 years and 13-15 years.

deft was assessed among 6-12 years aged individuals only. 323 subjects were assessed for deft. The mean deft for 6-12 years was 3.38 ± 3.10 . Mean deft of males was 5.38 ± 3.42 and that of females was 2.85 ± 2.29 . A statistically significant difference was observed among the groups ($p < 0.001$) (Table 4).

542 subjects were assessed for DMFT in both the age groups. The mean DMFT was higher for the 13-15 years age group, i.e. 5.24 ± 3.25 , than that of 6-12 years age group, i.e. 3.42 ± 2.80 . A statistically significant difference was observed among the groups ($p < 0.001$). (Table 5) Mean DMFT of males was higher, 5.41 ± 3.2 and that of females was 3.85 ± 2.8 . A statistically significant difference was observed among the groups ($p < 0.001$). (Table 6)

Table 1- Distribution of study subjects based on age and gender

			Gender		Total
			Male	Female	
	6-12 years	Count	95	270	365
		% within Gender	41.67%	80.84%	64.95%
	13-15 years	Count	133	64	197
		% within Gender	58.33%	19.16%	35.05%
Total		Count	228	334	562
		% within Gender	100%	100%	100.0%

Chi-square= 386.305, P-value<0.001

Table 2- Distribution of Study Subjects Based on Diet And Gender

			Gender		Total
			Male	Female	
Diet	Vegetarian	Count	110	187	297
		% Within Gender	48.25%	55.98%	52.85%
	Mixed	Count	118	147	265
		% Within Gender	51.75%	44.02%	47.15%
Total		Count	228	334	562
		% Within Gender	100.0%	100.0%	100.0%

Chi- square= 1.537, P-value= 0.215

Table 3- Distribution of Study Subjects based on CPI score and Age Group

			CPI					Total
			Healthy	Bleeding	Calculus	Pocket 4-5mm	Pocket 6mm Or More	
Age	6-12 years	Count	144	109	112	-		365
		% within Age	39.45%	29.86%	30.86%			100.0%
	13-15 years	Count	76	70	42	6	3	197
		% within Age	38.57%	35.53%	21.31%	3.07%	1.52%	100.0%
Total		Count	220	179	154	6	3	562
		% within Age	39.14%	31.85%	27.40%	1.07%	0.54%	100.0%

Chi square=409.439, P-value<0.001

Table 4- Distribution of Study Subjects based on deft and Gender

	Gender	N	Mean	Std. Deviation	Std. Error Mean	t	P-value
deft	male	151	5.3810	3.42902	.26455	9.415	<0.001
	female	172	2.8542	2.29062	.13498		

Table 5- Distribution of Study Subjects based on Mean DMFT and Age groups

	N	Mean	Std. Deviation	Std. Error	F	P-value
6-12 years	355	3.4225	2.80164	.14870	85.837	<0.001
13-15 years	187	5.2437	3.24847	.23144		
Total	542	4.4656	3.21549	.06736		

Table 6- Distribution of Study Subjects based on Mean DMFT and Gender

	N	Mean	Std. Deviation	Std. Error	t	P-value
male	334	5.4139	3.24264	.08865	25.2	<0.001
female	208	3.8593	2.76042	.08999		
Total	542	4.9656	3.21549	.06736		

DISCUSSION:

Lack of health care awareness, lack of health care services, lack of funds are common among all the under-privileged sections of society. This leads to compromised overall health and oral health status of the above-said affected groups. Many studies have been conducted on the Dental Caries and Periodontal status of various under-privileged groups like blind children, physically disabled, mentally disabled, low-socio economic status children in India, but few studies have been conducted on orphanage children. So, this study was conducted to assess the Dental Caries status and periodontal status of children belonging to orphanages.

In the present study, the subjects were divided into 2 age groups 6-12 years and 13-15 years age group. There were more number of females than males unlike orphanages of other regions,⁸ which may be related to less adoption rate of females than males in orphanage.

The mean deft of the study was 3.38 ± 3.10 . deft of the children in this study was higher than the deft values of the studies done on orphanage children in Jammu and Kashmir⁸, institution based street children of Andra Pradesh⁹. Greater deft can be associated with poor oral hygiene maintenance, more consumption of sticky food, improper brushing technique, lack of oral hygiene awareness among care takers, wardens, lack of oral health facilities and lack of oral health funds.⁹ Mean deft of males was higher than that of females, which is

similar to the findings of study done in Jammu And Kashmir and Mysore.^{7,8} This can be attributed to poor oral hygiene maintenance and poor oral health attitude among males than females.

The mean DMFT for the 13-15 years age group was 5.24 ± 3.25 and that of 6-12 years age group was 3.42 ± 2.80 . The figures are not in similar to the findings of the study done on children in Mysore. Increased DMFT in higher age group can be associated to poor oral hygiene maintenance in the higher group. Mean DMFT of males was higher than that of females. This finding contradicts with the finding done in mysore, jammu and Kashmir.^{7,8} This can be attributed to poor oral hygiene maintenance and poor oral health attitude among males than females and more concern on esthetics, appearance, hygiene among females than in males and moreover females are more particular about maintaining aesthetics, appearance, cleanliness and hygiene while males are negligent about their health, particularly oral health.¹⁰

In the present study, prevalence of gingival bleeding was 31.85%. The finding of the study is less in comparison to the study done in mysore.⁷ Bleeding gums, calculus were more prevalent in 6-12 years age group than in 13-15 years age group. This can be linked to poor oral hygiene maintenance in the mixed dentition phase, gingival changes during tooth eruption and shedding.¹¹

Limitations of the study:

The study does not give idea about oral hygiene practices of the orphanage children in Patna. Data on oral health status of same state is very scarce so comparison with similar group was not possible. Comparison with non-orphan population could give us more clearer picture of the high risk group.

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