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Original article

Oral Health Status And Treatment Needs Among Children And Adolescents In Orphanages Of Bhopal Madhya Pradesh: A Cross-Sectional Study

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ABSTRACT

Background: Parents are the primary caretakers and saviors of a child but woefully thousands of children have to lead their lives without parents, the later either being dead or incapable of bringing up their children, such section of the society is called as orphans. There is dearth of information available about the oral health status of orphan individuals and to fill this gap, the present study is undertaken.
Objectives:1. To assess the oral health status and treatments needs of children and adolescents residing in the orphanages of Bhopal district.2. To provide a baseline data for planning a comprehensive oral health care program for the same population. **Methodolgy and Study Design:** A descriptive cross-sectional study is conducted in 13 orphan institutions. The total study population is 441, comprising of 337 (76.4%) males and 104(23.6%) females in the age group of 5-18 years. WHO Oral Health Assessment Form 1997 is used to record the clinical parameters. Clinical examination was carried out using plane mouth mirror and CPI probes. Statistical analysis was performed using chi-square test and P value ≤ 0.05 will be considered as statistically significant.**Results:** In extra oral examination 6% subjects had ulceration, sores, fissures in head neck region. In Intra oral examination, ulceration 60(13.6%), candidiasis 2(0.2%),abscess 74(16.9%), enamel opacity/ hypoplasia 33(7.5%), fluorosis 58(13.3%), periodontal disease 81.7%, gingival bleeding 21.2%(n=93), calculus prevalence 54.4%(n=240). **Conclusion:** overall results show dental caries was low as compared to gingivitis and calculus.

Introduction

As a whole in the continent of Asia, total orphan population forms a turgid number of 5,72,20,000 accounting to 5.8% of the total child population. India is home to 19% of the world's children. Every year around 26 million children are born in the country and more than one third of the country's population is below 18 years, which is approximately around 440 million (40%) of the total population in India. The total number of orphan children in India is estimated to be 2,32,46,000 in the year 2010 which accounts for 6.8% of the total child population.[2,3]

Children are future of the nation and the strength of a nation lies in a healthy, protected, educated,well developed child population that will grow up to be productive citizens of the country.[3] As orphan children comprises of a deprived isolated population, deserving special attention to become robust citizens, physically fit, mentally alert and morally healthy, endowed with the skills and motivation
needed by society.[4]

Dental caries and periodontal disease are among the most prevalent or widespread conditions in children.[8]

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Age	Male		Female		Combined/Total	
	No	%	No	%	No	%
5-9	81	24	22	20.7	103	23.2
10-12	126	37.5	36	34.6	162	36.8
13-15	95	28.1	33	31.7	128	29
16-18	35	10.4	13	13	48	11
Total	**337**	**100.00**	**104**	**100.00**	**441**	**100.00**
Mean age	**5.59±1.61**		**5.85±1.6**		**5.65±1.61**	

SD : standard deviation

Table 1 : Distribution of study population by Age and Gender

Characteristics	n (441)	% (100)
Ethnic froups		
Hindu	425	96.4
Muslim	13	2.9
Sikh	0	0
Christian	3	0.7
Others	0	0
Occupation		
Students	425	96.4
Small scale industry worker	16	3.6
Others	0	0
Duration of stay in orphanage		
1-3 years	282	64
4-7 years	135	30.6
≥8 years	24	5.4
Type of location of orphanage		
Urban	235	53.2
Peri-urban	24	5.5
Rural	182	41.3
Educational level		
Up to primary	203	46
Middle	175	39.7
Senior secondary	63	14.3

Table 2 : Distribution of study population according to demographic characteristics.

Enamel Opacities / Hypoplsia	Male		Female		Combined/Total	
	No	%	No	%	No	%
Normal	274	81.2	88	85.1	362	82.1
Demarcated Opacity	14	4.3	2	1.4	16	3.6
Diffuse Opecity	28	8.3	5	4.8	33	7.5
Hypoplasia	15	44	3	2.9	18	4.1
Demarcated opacity & Hypoplasia	3	0.5	0	0.5	3	0.8
Demarched opacity and Hypoplasia	3	0.5	0	0.5	4	0.9
Diffuse opacity and Hypoplasia	-	-	1	1.4	1	0.3
All Three conditions	-	-	3	2.9	3	0.7
Not recoreded	-	-	-	-	-	-
Total	337	100.00	104	100.00	441	100.00

x^2=19.252, df = 4, p=0.001* (* Statistically significant)

Table 3 : Distribution of Enamel Opacities/Hypoplasia by gender among study population using Modified Development Defects of Enamel Index (DDE)

Enamel Opacities / Hypoplsia	Male		Female		Combined/Total	
	No	%	No	%	No	%
Normal	239	70.8	76	73.1	315	71.3
Questionable	4	1.3	0	0	4	1
Very mild	9	2.7	2	2.4	11	2.6
Mild	39	11.9	9	8.2	48	10.9
Moderate	41	12.3	17	16.3	58	13.3
Severe	4	1.2	0	0	4	0.9
Excluded	-	-	-	-	-	-
Not recorded	-	-	-	-	-	-
Total	337	100.00	104	100.00	441	100.00

x^2=4.593, df = 4, p=0.051* (* Statistically not significant)

Table 4 : Distribution of Dental Fluorosis by Gender among study population using Dean's fluorosis index.

Numerous studies have shown a difference in prevalence of dental diseases among underserved population and general populations.[9,10]

MATERIALS AND METHODS:

A descriptive cross-sectional study is conducted in 13 orphan institutions. The total study population is 441, comprising of males and females in the age group of 5-18 years. WHO Oral Health Assessment Form 1997 is used to

record the clinical parameters. Clinical examination will be carried out using mouth mirror and CPI probes. Statistical analysis will be performed used chi-square test and P value $\leq$ 0.05 will be considered as statistically significant.

CPI	Male		Female		Combined/Total	
	No	%	No	%	No	%
Health	61	18.2	19	18.8	81	18.3
Bleeding	75	22.4	18	17.3	93	21.2
Calculus	186	55.1	54	51.9	240	54.4
Pocket (4-5 mm)	13	4	12	11	25	5.7
pocket (6mm or more)	1	0.3	1	1	2	0.4
Excluded sextant	-	-	-	-	-	-
Total	337	100.00	104	100.00	441	100.00

x^2=3.977, df = 2, p=0.0465* (** Statistically not significant)

Table 5 : Prevalence of Periodontal disease conditions by Gender among study population.

Age in years	no. of persons examined	0-3 mm		4-5mm		6-8mm		Not recorded	
		No	%	No	%	No	%	No	%
5-9 years	102	0	0	0	0	0	0	102	100.0
10-12 years	162	0	0	0	0	0	0	162	100.0
13-15 years	178	15	11.7	5	3.9	4	3.1	104	81.3
116-18 years	48	26	54.6	19	39.2	3	6.2	0	0
Total	441	41	9.4	24	5.4	7	1.6	369	83.6
MeaN ±SD	**441**	**0.47±1.05**		**0.031±0.13**		**0.009±0.05**		**2.48±1. 13**	

x^2=309.5, df = 4, p=0.001* (** Statistically significant)

Table 6 : Prevalence of Loss of Attachment by age among study population

Sampling Design: All the available children and adolescents residing in the orphanages (Government and private) of Bhopal district forms the study population. Study Period was 6 months.

Sampling Technique:Simple Random Sampling was done.

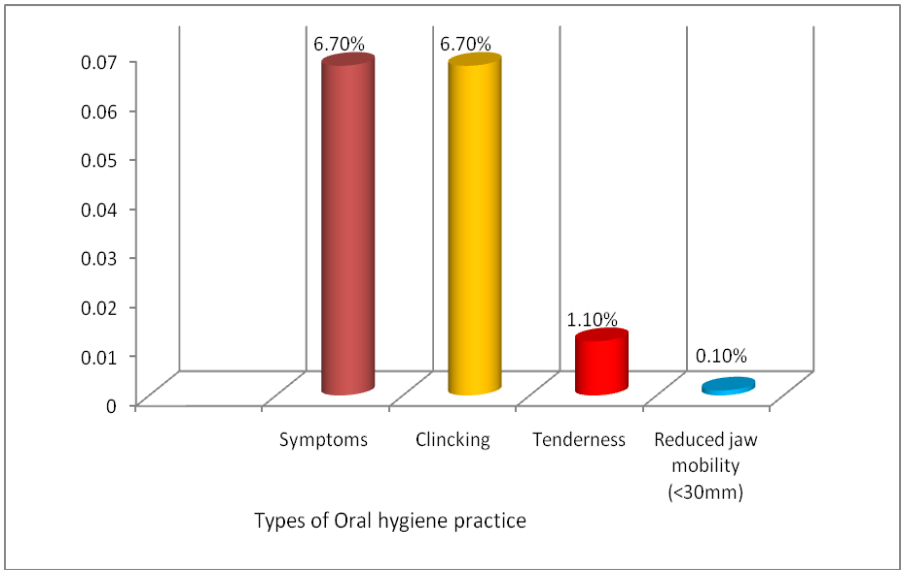
Inclusion criteria: All the subjects both boys and girls residing in the orphanages, available during the

study period and The subjects who are willing to participate in the study.

Exclusion criteria: Subjects not willing to take part in the study.

	Primary teeth (n=265)		Permanent teeth (n=441)	
	No	%	No	%
DT/dt	131	49.6	175	39.6
FT/ft	0	0.0	11	2.6
MT	-	-	17	4.0
DMFT/dft	131	49.6	181	41.0
Root caries	-	-	0	0.0
Tooth Trauma	46	17.5	48	10.9

Table 7 : Prevalence of Dental caries and Dental traumatic injuries study population.



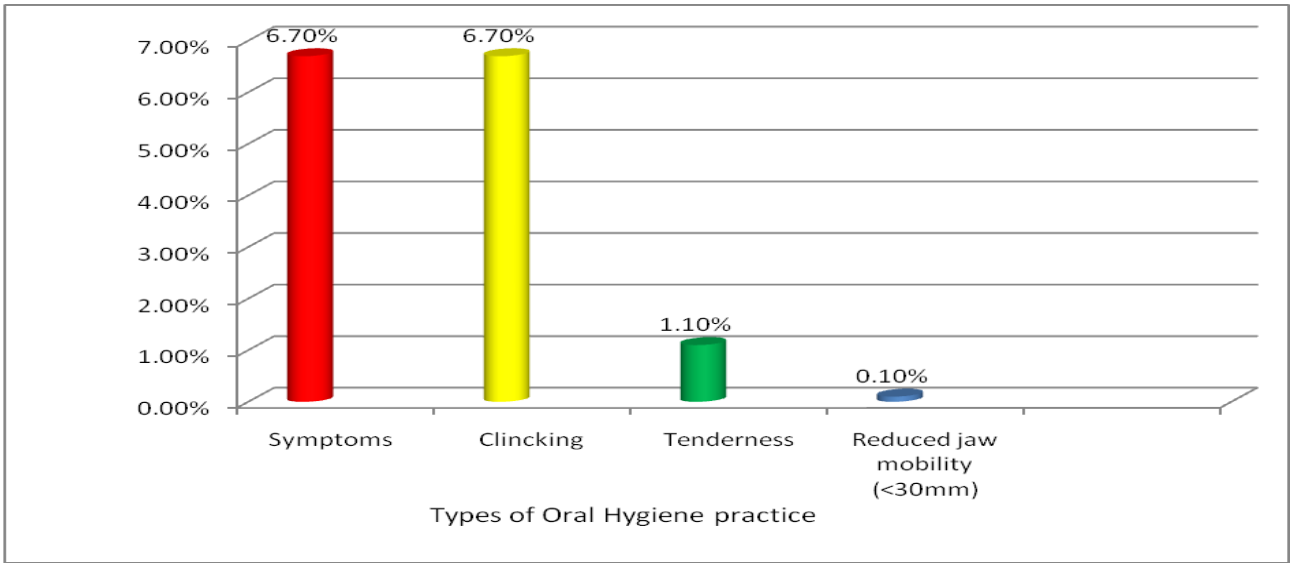
Graph 1 : Distribution of study population according to oral hygiene practice.

A	No Oral Hygiene aid used
B	Chew sticks
C	Finger + Rangoli powder/charcoal
D	Finger + Tooth paste/Tooth powder
E	Tooth brush+Tooth paste/Tooth powder

Survey: A pilot survey was conducted in two randomly selected centers for two days to have prior idea regarding the number of children to be examined per day and to check the average time required for examination of each child

Survey Proforma:

The survey proforma was prepared using a self administered structured questionnaire written in English validated through a pretested survey to assess the demographic details, smoking, alcohol use,



A	Normal
B	Ulceration (Head, Neck, Limb)
C	Ulceration (Nose, Cheek, Chin)
D	Ulceration, sores, erosions, fissures (Commisures)
E	Ulceration, Sores, erosions, fissures (vermillion border)
F	Enlarged lymph nodes (head, neck)

Graph 1 : Distribution of study population according to oral hygiene practice:

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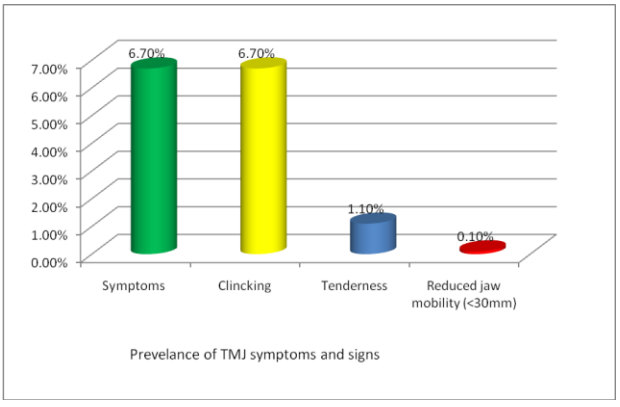
chewing and dietary habits and WHO Oral Assessment Form(1977) to assess the oral health status and treatment needs of the study population.

A questionnaire consisting of three sections :

A. General information: demographic data, educational qualification, duration of stay in orphanage and dental/ medical history.

B. Oral hygiene practices: Oral hygiene practices registered will include type of cleaning, materials used, frequency of cleaning teeth.

C. Adverse habits: smoking, tobacco chewing, pan chewing and alcohol consumption.



A	Normal
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E	Ulceration, Sores, erosions, fissures (vermillion border)
F	Enlarged lymph nodes (head, neck)

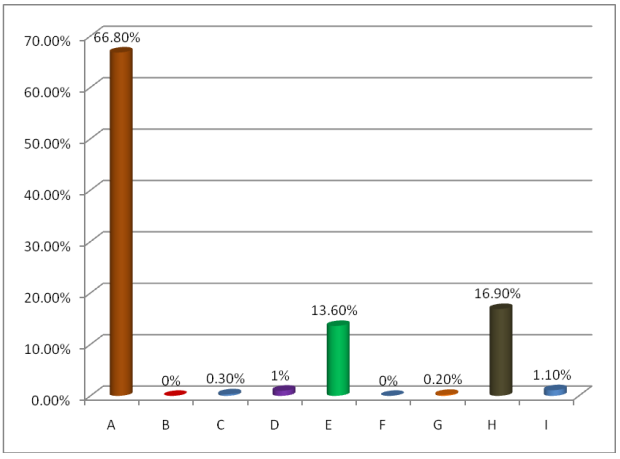
Graph 3 : Distribution of subjects according to **TMJ** assessment

CLINICAL EXAMINATION: It was carried out using mouth mirror and CPI (Community Periodontal Probe) under adequate natural day light.

1) Oral hygiene was evaluated and compared.

2) oral findings mainly in form of ulcerations, enlarged lymph nodes in head and neck region will be recorded. Temporomandibular joint was assessed of clicking sound, tenderness, reduced jaw mobility.

3) Intra Oral findings was checked such as periodontal attachment, enamel disorders (fluorosis) gingivitis,



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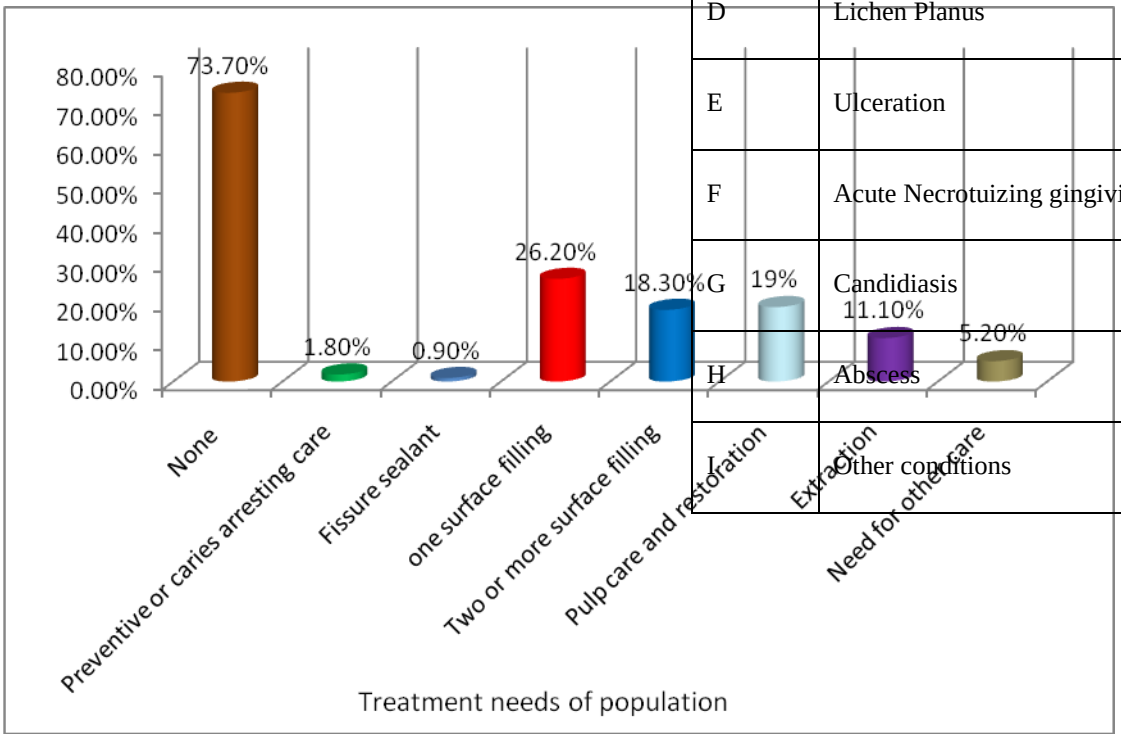
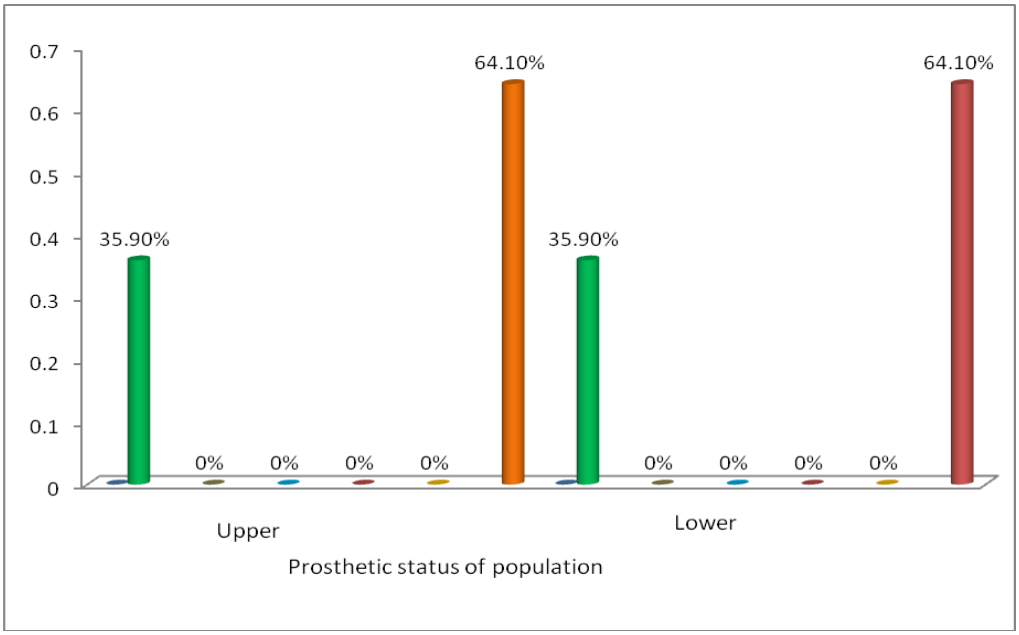
Graph 4 : Distribution of subjects according to Oral mucosal Conditions.

A	Normal
B	malignant Tumour (Oral cancer)
C	Leukoplakia
D	Lichen Planus
E	Ulceration
F	Acute Necrotuizing gingivitis
G	Candidiasis
H	Abscess
I	Other conditions

pockets, caries prevalence in deciduous teeth and pockets, caries prevalence (DMFT indices were used)



Graph 5 : Distribution of Study population according to treatment needs.



Graph 6 : Distribution of Study population showing prosthetic status

Prosthetic states was recorded for subjects aged 14 years and above. WHO recommends it is not to be recorded for children. Application of pits fissure sealants and use of fluorides to prevent tooth decay was emphasized through this research.

Statistical analysis Data Analysis: The Proforma was arranged systematically and information was transferred onto the master chart created in Microsoft Excel (2007) for the purpose for data analysis. Data comparison was done by applying specific statistical tests to find out the statistical significance of the comparisons. Quantitative variables were compared using mean values and qualitative variables using proportions. Significance level was fixed at $p < 0.05$.

1.) **Chi- Square (χ^2) Test:**

This is a non-parametric test, used when data is expressed in frequency or proportion or percentages.

where

$$X^2 = \sum \frac{(o-e)^2}{e}$$

O = Observed frequency

E = Expected frequency

Official Permission and Ethical clearance:

Written permission was obtained from the District Children Officer, Department of Social Justice and Empowerment, Bhopal district to conduct the study.

Also the study was reviewed for clearance from the Ethical Committee of Maulana Azad University Rajasthan, Jodhpur School of Public Health .

Limitation: 1.)**Fi**rstly many children and adolescents were not be cooperative during study and examination procedure.

2.) There was difficulty in assessing the efficacy of preventive strategies and curative therapies at population level.

3.) It was challenging to carry out work force planning.

4.) Ethical consideration is most important when dealing with a sample consisting of children and adolescents. Maintaining confidentiality, taking prior consent and permissions were mandatory and challenging.

CONCLUSION:

The findings of the study provides with some insight into the complex relationship between the institutional status of the orphans and their oral health. Dental caries experience was low but the prevalence of periodontal disease (mainly gingival bleeding and calculus) and fractured teeth was high. The unmet needs for decayed teeth were also found to be high indicating a very poor accessibility and availability of any oral health care. Clearly it can be concluded that this community has experienced a low utilization of preventive or therapeutic oral health services.

Oral health care for these children needs to be aimed at oral hygiene and prevention of periodontal diseases and investigations also need to be made in to the causes of trauma. The goal must also be to improve oral health attitudes and behavior of care takers as well as children and adolescents.Inequalities in oral health are not just an artifact, real difference does exist. Point is to identify the factors generating inequalities and their implications in terms of policy and service delivery. Neglect of oral health of this socially deprived class is evident by present study.It seems apparent that oral health problems cannot be resolved by dentists alone. Effective inclusion of care takers, community leaders, voluntary members and primary health care workers play important role in delivery of preventive and curative services.

During the study, treatment such as scaling, fluoride application, pit and fissure sealants application was given to children, comprehensive and preventive oral health program was formulated. Interview and examination at each orphanage was concluded with dental health education. Education regarding oral heath, oral hygiene maintenance and prevention of dental diseases was given using aids like posters, charts, models.

Recommendations :

I. **Comprehensive oral health plan**

1. Education.

a. School curriculum : orphan institutions should include oral health education as part of training or socialization programs and in-service training in promotion of good oral health for orphaned population.

b. Dental health programmes : These should emphasize the right kind of oral health practices e.g. proper tooth brushing techniques, rinsing after every meal to be advocated.

c. Dietary advice for this population should be made within the context of healthy eating policies.

d. All preventive activities should have educational component,oral health assessment including messages promoting oral health,well-planed proggramme of preventive dental health.

e. Institutional caregivers : It is recommended that caregivers should be educated and trained following a communication strategy to educate children and provide counseling about tobacco control initiatives.

2. Preventive

a. School based oral health programmes: Regular school - based tooth brushing programme should be implemented and reinforced in this population .

b. Pit and fissure sealant: pit and fissure sealants should be applied to permanent teeth soon after eruption, as these measures are highly effective in preventing occlusal caries

c. Traumatic injuries: traumatic dental injuries are preventable requiring early and consistent preventive, reparative, orthodontic as well as traumatic protection.

d. Orthodontic treatment for underserved subjects has long been neglected, and this treatment need should be taken into account in future planning of oral health care.

e. Positive links between educational establishments and dental serveces are essential for promoting the oral health of this population.

3. Curative:

a. The proportion of subject with bleeding, calculus,pockets should be provided with proper oral prophylaxis and periodontal therapies by specially trained personnel such as dental hygienists.

b. Should consider the emergency treatments like relief of pain, pulpal abscess drainage, and extraction of the grossly destructed teeth: Restorative treatments like 1 or 2 surface fillings, root canal restorations followed by crown placements.

II. Recommendations for Government organization:

1. Integration of oral health care programme: A multi sect oral approach in which health , education and nutritional components come together mainly focusing on whole orphaned population should be implemented.

2. Involvement of nearby PHC s, Multipurpose workers and Accredited social health activist

3. Involvement of social welfare sector: Non Government organizations should be encouraged to join our efforts to promote oral health care for these populations

4. Public Private relationship: private organizations can distribute free toothpastes, toothbrushes along with leaflets for oral health promotion.

5. Adoption: adoption should be encouraged to the maximum so as to render these under looked children a safer healthier environment flledged with love and affection of parents.

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