

**AN ASSESSMENT OF ORAL HEALTH STATUS
AND TREATMENT NEEDS OF 12 AND 15
YEARS OLD SCHOOL GOING CHILDREN OF
FISHERMEN COMMUNITY RESIDING AT
EAST COAST ROAD, CHENNAI, TAMILNADU**

Dissertation Submitted to

THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY

In Partial Fulfillment for the Degree of
MASTER OF DENTAL SURGERY



**BRANCH VII
PUBLIC HEALTH DENTISTRY
MARCH 2013**

**THE TAMIL NADU Dr. MGR MEDICAL UNIVERSITY
CHENNAI**

DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation titled “**An assessment of Oral health status and Treatment needs of 12 and 15 years old School going children of Fishermen community residing at East coast road, Chennai, Tamil Nadu**” is a bonafide and genuine research work carried out by me under the guidance of **Dr.M.Shivakumar MDS**, Professor and Head of the Department of Public Health Dentistry, Ragas Dental College and Hospital, Chennai.

Dr. M.Rajmohan

Post Graduate Student

Dept of Public Health Dentistry,
Ragas Dental College and Hospital,
Chennai.

Date:

Place: Chennai

**THE TAMIL NADU Dr. MGR MEDICAL UNIVERSITY
CHENNAI**

DECLARATION BY THE GUIDE

I hereby declare that this dissertation titled “**An assessment of Oral health status and Treatment needs of 12 and 15 years old School going children of Fishermen community residing at East coast road, Chennai, Tamil Nadu**” is a bonafide and genuine research work carried out by **Dr.M.Rajmohan**, Post Graduate Student in the Department of Public Health Dentistry, Ragas Dental College and Hospital, Chennai under my guidance in partial fulfillment for the requirement of the degree of **Master of Dental Surgery (Public Health Dentistry)**.


Dr. M. Shivakumar, MDS

Professor and Head
Department of Public Health Dentistry
Ragas Dental College and Hospital,
Chennai.

Dr. M. SHIVAKUMAR, MDS

Professor and HOD
Dept. of Public Health Dentistry
Ragas Dental College and Hospital, Chennai-110

Date: 1/12/12
Place: Chennai

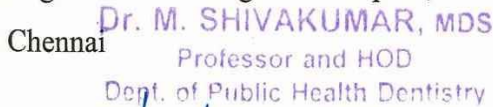
**THE TAMIL NADU Dr. MGR MEDICAL UNIVERSITY
CHENNAI**

**ENDORSEMENT BY THE HEAD OF THE DEPARTMENT
AND HEAD OF THE INSTITUTION**

This is to certify that this dissertation titled “An assessment of Oral health status and Treatment needs of 12 and 15 years old School going children of Fishermen community residing at East coast road, Chennai, Tamil Nadu” is a bonafide and genuine research work done by **Dr.M.Rajmohan**, under the guidance of **Dr.M.Shivakumar MDS**, Professor and Head, Department of Public Health Dentistry, Ragas Dental College and Hospital, Chennai.


Dr. M. Shivakumar, MDS

Professor and Head
Dept of Public Health Dentistry
Ragas Dental College and Hospital, Chennai

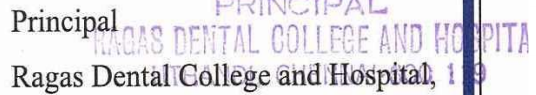

Dr. M. SHIVAKUMAR, MDS
Professor and HOD

Dept. of Public Health Dentistry
Ragas Dental College, Chennai-119.

Date: 1/12/12

Place: Chennai


Dr. S. Ramachandran, MDS

Principal

Ragas Dental College and Hospital, Chennai

Date: 20.12.12

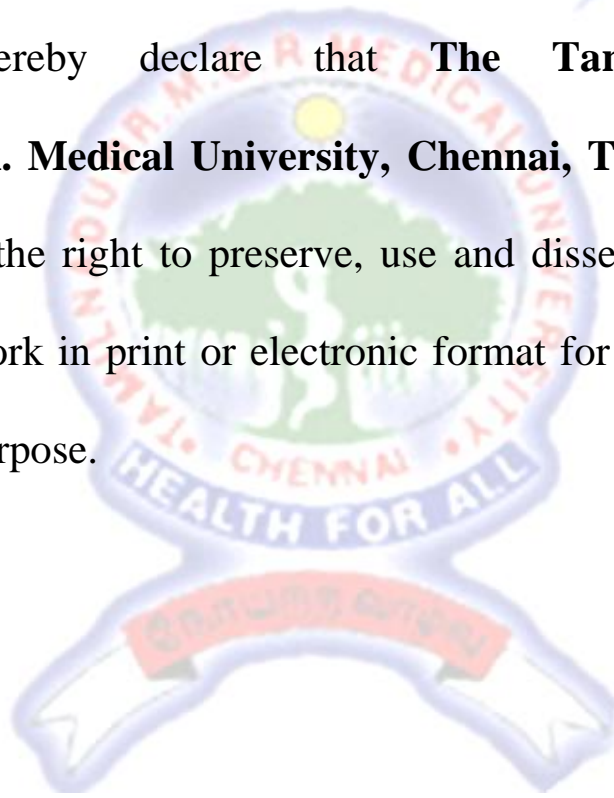
Place: Chennai

**THE TAMIL NADU Dr. MGR MEDICAL UNIVERSITY
CHENNAI**

COPYRIGHT

DECLARATION BY THE CANDIDATE

I hereby declare that **The Tamil Nadu
Dr. M.G.R. Medical University, Chennai, Tamil Nadu**
shall have the right to preserve, use and disseminate this
research work in print or electronic format for academic /
research purpose.



Date:

Place: Chennai

Signature of the Candidate

Dr.M.Rajmohan

ACKNOWLEDGEMENT

*I thank **Dr.M.Shivakumar MDS.,** Professor and Head of the Department of Public Health Dentistry, Ragas Dental College and Hospital, Chennai, who has been instrumental in shaping my views throughout the completion of my dissertation in all aspects. His enthusiasm and unlimited zeal proved to be a major driving force throughout the dissertation completion. Sir, I solemnly express my deep felt gratitude for your valuable and great guidance and suggestions.*

*I express my deep sense of gratitude to **Dr.P.D.Madan Kumar MDS.,** Associate Professor, who was there at each step guiding me to prepare this dissertation. I am deeply grateful for his detailed and constructive comments, and for his important support throughout this work.*

*I also thank **Dr.I.Nandabalan MDS.,** and **Dr.S.Shyam MDS.,** Senior Lecturers for their motivation and suggestions towards the completion of the dissertation.*

*I take this opportunity to thank **Dr. S. Ramachandran MDS.,** Principal, Ragas Dental College & Hospital and **Dr. N.S. Azhagarasan, MDS.,** and **Dr.N.R.Krishnaswamy, MDS.,** Vice-Principals, Ragas Dental College for their generous support rendered throughout my course.*

*I would like to extend my gratitude to **Mr. Porchelvan**, Statistician, for his valuable help in statistical analysis.*

*I like to thank **Mrs.Selvakumari**, the Chief Educational Officer, Kancheepuram District for giving me permission to carry out this dissertation. I would also like to thank **Mr.Julius**, the Assistant Director of Fisheries, Neelangarai for providing data regarding Fishermen. A special thanks to all the Head Mistress, Teachers and Students who participated in this study without whom this project would have ever been possible.*

*I also thank my batchmate **Dr.K.Rajeswary** for encouraging me and helping me in completing this dissertation. I extend my gratitude to my seniors **Dr. S.Aparna** and **Dr.Delfin Lovelina** and Juniors **Dr.S.Arun kumar** and **Dr.M.Dinesh Dhamodar** for their friendly help, support and cooperation throughout my postgraduate life.*

I express my love and thanks to my loving Dad and Mom and all at home who made my dreams come true.

Truly,

Dr.M.Rajmohan

ABSTRACT

Background:

The present study was conducted to assess the oral health status and treatment needs of 12 and 15 years old school going children of fishermen community residing at East coast road, Chennai.

Objectives:

1. To assess the oral health status and treatment needs of 12 and 15 years old school going children of fishermen community residing at East coast road, Chennai using WHO oral health assessment proforma 1997.

Methodology:

A cross-sectional descriptive study was conducted to assess the oral health status and treatment needs of 12 and 15 years old 650 School children of fishermen community residing at East coast road, Chennai. Data was collected using a survey proforma which comprised of a questionnaire and WHO Oral Health Surveys – Basic Methods Proforma (1997). The collected data was subjected to statistical analysis.

Results:

Results showed that 350 children were 12 years old and 300 children were 15 years old. About 419 (64.5%) were satisfied on appearance of their

teeth. Majority of the children, 617 (94.9%) used tooth paste and tooth brush to clean their teeth. A large percentage of the children, 424 (65.2%) had not visited dentist before. Of those visited, 133 (58.8%) children had visited dentist for Tooth ache. Mean DMFT Value of 12 year old private and Government school children were 2.01 and 2.27 respectively. While Mean DMFT value of 15 year old private and Government school children were 2.28 and 3.15 respectively. Majority of the children, 351 (54%) were in Watch-out zone during sweet score calculation with significant relation to DMFT. Majority of the children, 464 (71.3%) were taking fish more than 3 days in a week with significant relation to DMFT. 172 (26.5%) children had definite malocclusion and needed elective treatment. 30 (4.6%) children had severe malocclusion and treatment is highly desirable.

Conclusion:

The oral health status of fishermen children was poor with high prevalence of periodontal disease and dental caries. Regular oral examinations by dental professionals, dental health education to motivate subjects to receive regular dental check-up and to maintain oral hygiene, adoption by nearby Dental colleges if any and involvement of NGO'S like Rotary Club, Lions Club, IDA will be needed to improve the oral health status of these workers.

Key words:

Fishermen community, oral health status, WHO oral health proforma, treatment needs.

CONTENTS

S.NO.	INDEX	PAGE NO.
1.	INTRODUCTION	1-4
2.	AIM AND OBJECTIVES	5
3.	REVIEW OF LITERATURE	6-18
4.	MATERIALS AND METHODS	19-27
5.	RESULTS	29-63
6.	DISCUSSION	64-74
7.	SUMMARY	75-77
8.	CONCLUSION	78
9.	RECOMMENDATION	79
10.	BIBLIOGRAPHY	80-84
11.	ANNEXURE	85-91

LIST OF TABLES

TABLE NO.	TITLES	PAGE NO.
1	Distribution of study population based on Age, Gender and type of Institution	29
2	Distribution of study population based on satisfaction on appearance of teeth	31
3	Distribution of study population based on Tooth ache or discomfort in teeth	33
4	Distribution of study population based on visited Dentist during past 12 months	34
5	Distribution of study population based on Brushing Habit	36
6	Distribution of study population based on frequency of brushing their teeth	38
7	Distribution of study population based on Brushing aids used	39
8	Distribution of study population based on Sweet score	41
9	Distribution of study population based on frequency of Fish Intake	42
10	Distribution of study population based on source of drinking water.	44
11	Distribution of study population based on TMJ symptoms, clicking, tenderness, reduced jaw mobility	45
12	Distribution of study population based on oral mucosa condition	47
13	Distribution of study population based on Enamel Opacities	48
14	Distribution of study population based on Dental Fluorosis	50
15	Distribution of study population based on Community Periodontal Index	51

16	Distribution of study population based on Crown Status	52
17	Distribution of study population based on Root status	54
18	Distribution of study population based on Treatment needs	55
19	Distribution of study population based on Mean DMFT	57
20	Distribution of study population based on Prosthetic treatment needs	58
21	Distribution of study population based on Aesthetic Index (DAI)	62

LIST OF GRAPHS

GRAPH NO.	TITLES	PAGE NO.
1	Distribution of study population based on Age, Gender and type of Institution	30
2	Distribution of study population based on satisfaction on appearance of teeth	31
3	Distribution of study population based on Tooth ache or discomfort in teeth	33
4(a)	Distribution of study population based on visited Dentist during past 12 months	35
4(b)	Distribution of study population based on reason for last Dental visit	35
5	Distribution of study population based on Brushing Habit	37
6	Distribution of study population based on frequency of brushing their teeth	38
7	Distribution of study population based on Brushing aids used	40
8	Distribution of study population based on Sweet score	41
9	Distribution of study population based on frequency of Fish Intake	43
10	Distribution of study population based on source of drinking water	44
11	Distribution of study population based on TMJ symptoms, clicking, tenderness, reduced jaw mobility	46
12	Distribution of study population based on oral mucosa condition	47
13	Distribution of study population based on Enamel Opacities	49
14	Distribution of study population based on Dental Fluorosis	50

15	Distribution of study population based on Community Periodontal Index	51
16	Distribution of study population based on Crown status	53
17	Distribution of study population based on Treatment needs	56
18	Distribution of study population based on Mean DMFT	57
19(a)	Distribution of study population based on upper Prosthetic treatment needs	59
19(b)	Distribution of study population based on lower Prosthetic treatment needs	60
20	Distribution of study population based on correlation with sweet score and DMFT	60
21	Distribution of study population based on correlation with Fish intake and DMFT	61
22	Distribution of study population based on Aesthetic Index (DAI)	63

LIST OF FIGURES

FIGURES NO.	TITLES	PAGE NO.
1	Oral Examination	28
2	Armamentarium	28

INTRODUCTION

Health is a fundamental human right and is the essence of productive life. Health implies the relative absence of pain and discomfort and a continuous adaptation and adjustment to the environment to ensure optimal function.¹ Health is multi-factorial, the factors which influence health lie both within the individual and externally in the society in which he or she lives. Each disease has its unique natural history, which is not necessarily the same in all individuals. Disease results from a complex interaction between man, age and environment.²

Oral health is an integral part of general health. Poor oral health can have a detrimental effect on general health. The mouth is also a portal of entry for pathogens and toxins, which can affect the oral health and if not cleared by the many defense mechanisms that have evolved to protect the oral cavity, may spread to the rest of the body.³ The consequences of poor oral hygiene and a diseased mouth can be disastrous to general health. In India, the major oral diseases are Dental caries and Periodontal diseases. According to National oral Health survey and Fluoride mapping of 2002,⁴ the prevalence of Dental caries was increasingly high in children and it is said that 60% of children in India were affected by Dental caries and were classified as High-risk population. In case of children, oral health plays a vital role. Oral health renders profound influence on children's growth and development, on their physical, mental and social aspects, their performance in school, and hence

their success in their later life time.⁵ Studies have shown that children who suffer from poor oral health are twelve times more likely to have more restricted-activity days including missing school than children with good oral health.⁶

The oral health of children is a significant public health issue.⁷ Oral diseases are diet and behavior-related diseases. Childhood oral diseases, if untreated, can lead to irreversible damage, pain, disfigurement and more serious general health problems. It will also cause loss of school time, low self-esteem and poor quality of life among children.⁸

India is a federation composed of 28 states and 7 union territories and is the seventh-largest country by geographical area, occupying 2.4% of the world's land area and is the second-most populous country with over 1.2 billion people supporting over 17.5% of the world's population. India having a diverse population with Agriculture as the predominant occupation in Rural India, accounting for about 52% of employment while livestock, forestry, fishing, hunting, plantations, orchards, and allied activities accounts for 2 percent.

Southern India being a peninsula, Fishing is a major industry in its coastal states, employing over 14 million people. Length of Coastline of Indian mainland is 6100 km with about 3827 fishing villages.⁹ Coastline of Indian mainland is surrounded by Arabian Sea in the west, Bay of Bengal in the east, and Indian Ocean in the south. The long coast line of India is dotted

with several major ports such as Kandla, Mumbai, Mangalore, Marmagao, Cochin in west coast and Chennai, Tuticorin, Vishakapatnam, and Paradip in its east coast. The state of Tamil Nadu has a long coastline of over 1076 km covering 13 districts.¹⁰ Chennai, sometimes referred to as the "Gateway to South India", is located on the south-eastern coast of India in the north-eastern part of Tamil Nadu on a flat coastal plain known as the Eastern Coastal Plains. The beach line of Chennai called the Marina Beach runs for 13 km along the shoreline of the city and is the second longest urban beach in the world. Hence, fishing is a major occupation in coastal areas of Chennai.

Fishing is a term applied to any activity which aims to capture fish or shellfish for subsistence, scientific, commercial or recreational purposes.⁹ A Fisherman is a person who engages in the activity of fishing. Some fishermen do this as profession, and may belong to a cooperative, corporation or union. Fishing may also be a subsistence activity.

The occupation of fishing is stressful due to difficult physical conditions, dislocation, isolation and less than ideal personal habits.¹¹ Fishermen have prolonged hours of continuous work, which are found to be correlated with high cigarette and alcohol consumption.¹² Diet is lacking in fruits and vegetables and meals eaten at very erratic intervals.¹³ Fishermen have lower socioeconomic status and their illiteracy adds to their poor oral hygiene, which may influence general and oral health.¹⁴ Oral diseases seem to be the most common health problem of seafarers world wide. Seafaring as an

occupation due to long sea voyages, the access to seamen to dental services is very limited and making regular check ups.¹⁵ Fishermen due to their stressful work in the night, would rest in day hours and they may not spare time to take care of their health and also their children's health and have poor oral health when compared with that of general population.¹⁶ As a result, Fishermen having little attention towards the oral health of children, they may be more prone for dental diseases. Also with the associated factors like diet, oral hygiene practice, they are at high risk population for dental caries and other dental diseases In India only few studies were done to assess the oral health status of fishermen children, so this study was done to assess the oral health status and treatment needs of 12 and 15 years old school going children of fishermen community residing at East coast road, Chennai.

AIM AND OBJECTIVES

AIM:

The aim of the study is to assess oral health status and treatment needs of 12 and 15 years old school going children of fishermen community residing at East coast road, Chennai.

OBJECTIVES:

1. To assess the oral health status and treatment needs of 12 and 15 years old school going children of fishermen community residing at East coast road, Chennai using WHO oral health assessment proforma 1997.
2. To assess the oral health perception, oral hygiene practices and diet pattern using a pretested questionnaire.
3. To compare the oral health status among these Children based on Age and Type of institution.
4. To suggest a Dental public health programme to cater the dental health needs of school going children of fishermen community residing at East coast road, Chennai using the obtained data.

REVIEW OF LITERATURE

Bhat.M,Nagesh.L,Akola.A (2007)¹⁷ conducted a study to assess the dental caries status and treatment needs of 267 children upto the age of 14 years belonging to fisher folk communities in coastal areas of Karnataka. WHO (1997) assessment criteria was used. Results revealed that among 155 subjects in 10-14 years age groups, 125 (80.64%) were affected by dental caries. Mean DMFT among 10-14 years age group was 1.896. According to treatment needs required among 10-14 years an average of 0.625 teeth needed one surface filling, 0.464 teeth required two surface filling, 0.335 teeth needed pulp care and 0.439 teeth needed extraction. It was concluded that magnitude of dental diseases was high in these children. Diet, availability of sticky carbohydrate rich food, presence of certain trace elements like selenium, relative humidity might have influenced the occurrence of Dental caries in this study population.

Reddy.V.C, Priya.S.H, Chaly.P.E, Ingle.N.A (2011)¹⁸ conducted a study to assess the prevalence of malocclusion and orthodontic treatment needs among 300 school children of 12-15 years old of Maduravoyal area, Chennai. Malocclusion was recorded according to the components of Dental Aesthetic Index as described by WHO oral health survey. The results revealed that 66 (22%) children had no segment crowding and 234 (78%) had one or two segment crowding. A total of 231(77%) children had no segment spacing and 69 (23%) children had one or two segment spacing. 261 children (87%)

had no midline diastema, 39(13.1%) had > 1mm diastema. 155 children (51.7%) had normal molar relation, 112(37.3%) had half cusp deviation and 33(11%) had full cusp deviation. Overall prevalence of malocclusion was 73.7%, out of which 79(26.3%) had no abnormality. 110(36.7%) had definite malocclusion requiring elective treatment, 83(27.7%) had severe malocclusion requiring highly desirable treatment.

Shivakumar.V,Gopinath.V,Saravanakumar.R,Anitha.V,Shanmugam.M (2011)¹⁹ conducted a study to find the prevalence and determinants of dental caries among 1205 school children of age group 4-17 years in Padur, Kanchipuram. WHO (1997) criteria was used to assess Dental caries. The results revealed that 64% of school children had dental caries. The prevalence is more in corporation and Government schools compared to private schools. Compared to those children who use pipe water for drinking, the odds of suffering from Dental caries was 2 times higher than those who use bore water for drinking. School children who brush only once a day had 94% higher odds of suffering from dental caries compared to those who brush twice or more times a day (OR=1.94). It was conclude that important policy and program implications, including the need for public information campaigns designed to inform people about the prevalence of Dental caries is required to promote access to improved dental care.

Kumari.M,Saha.S,Jaganath.G.V,Mohammad.S (2011)²⁰ conducted a study to assess the periodontal status of 1198 12 and 15 years old urban and

rural school going children of Lucknow. The results revealed that among 594 urban and 604 rural subjects, 593 used tooth brush and tooth paste while in rural population 282(46.69%) used tooth brush and tooth paste and 312(51.66%) used tooth brush and tooth powder to clean their teeth. In urban 573 brushed once daily and 21(3.53%) brush twice daily. In urban area 335(56.40%) had healthy score, 127(21.38%) had bleeding score and 132(22.22%) had calculus score. In rural 244b (40.39%) had healthy periodontium, 160(26.49%) had bleeding and 200(33.13%) had calculus. They concluded that exploring these links between clinical condition and personal and social outcomes provides opportunity to identify interventions to minimize consequences of oral diseases by dental health programmes.

Bhat.M (2008)²¹ conducted a study to assess the oral health status and treatment needs of 1000(599 males and 401 females) Harikantra rural fishing community in Karnataka. WHO (1997) proforma was used for the survey. The results revealed that among 155 subjects in age group of 10-14 years, 0.16 had mean CPI score of 2. Among 155 subjects in 10-14 years age group 99 subjects (63.87%) had dental caries and the mean DMFT was found to be 1.896. among the treatment needs of 10-14 year age group, an average of 0.625 teeth needed one surface filling, two surface filling (0.464), pulp care (0.335) and extraction (0.439). It was conclude that young persons from the same community could be selected and trained to deliver dental health

education to this community. Voluntary organizations need to render care to this rural depressed community.

Mehta.A,Gupta.J,Bhall.S (2011)²² conducted a study to find out the prevalence of Dental caries among 2615, 3-17 year old children studying in various government and private schools at Chandigarh using def and DMF Index. The results revealed that among 2615 children examined, 1307 were suffering from Dental caries depicting caries prevalence of 49.9%. There was no significant difference between males (51.1%) and females (48.8%). Mean DMF score in 12-17 years age group was 1.17. There was no significant differences in mean DMF among two genders. It was concluded that large majority of untreated carious lesions suggesting the lack of awareness among children, their parents and teachers regarding importance of good oral health.

Kaur.N,Hiremath.S.S (2011)²³ conducted a study to know the prevalence of traumatic injuries to permanent anterior teeth among 2000 government and private school children between the ages of 8-15 years old in Bangalore city. The results revealed that among the children with the history of trauma, 17.3% were boys and 11.4% were girls. The prevalence of traumatic injuries was 14.5%. Among total children of 12-15 years examined, 205(20.5%) children had history of trauma. Among these 205 children, 14.7% had minor malocclusion, 37.7% had definite malocclusion, 57.7% had severe malocclusion and remaining 60.8% had very severe malocclusion. It was concluded that prevalence of traumatic injuries was 14.5% and was higher

among private school children compared to government school children. On the whole, prevalence was more in boys when compared to girls.

Dhaval.P.R,Sujal.P.M (2011)²⁴ conducted a study to assess the gingival status and Dental caries status among 200 school going children aged 12 and 15 years old in Ahmedabad city. WHO methodology 1997 was used to assess the Dental caries status. The results revealed that mean DMFT score of male and female children of 12 year age group was 1.22 ± 1.56 and 1.02 ± 1.20 respectively. Mean DMFT score of male and female children of 15 year age group was 2.30 ± 2.43 and 2.26 ± 2.37 respectively. Mean DMFT score for 12 years old children was 1.11 ± 1.37 , while that of 15 years old children was 2.28 ± 2.40 . Majority out of 200 children, 135(67.5%) children needed one surface filling. It was concluded that implementation of oral health program at early age helps in improving preventive dental behavior and attitudes, which is beneficial throughout the life time. This can be achieved by educating the parents about dental health through school dental programme.

Anu.V,Shivakumar.M,Madankumar.P.D,Sureshbabu.A.M(2011)²⁵ conducted a study to assess the association between sweet score and Dental caries experience among 317 school children of 12-13 year old in Chennai. Sweet score was analyzed using 24 hour diet chart and Dental caries was measured by DMFT Index. The results revealed that among 138 urban population, 6.5% had excellent sweet score, 25.36% had good sweet score and 68.11% were in watch-out zone. Among 179 rural population, 18.40% had

excellent sweet score, 14.25% had good sweet score and 67.03% were in watch-out zone. Mean DMFT among rural population was 0.92 and urban population was 1.89. Among 179 rural children, 120 children who were in watch-out zone had a mean DMFT of 1.05. Among 138 urban school children, 94 children who were in watch-out zone had mean DMFT of 1.87. It was conclude that, since majority of children in urban and rural schools were in watch-out zone, early interventions like dietary counseling among school children can be appropriate to inhibit the carious process.

Saravanan,N,Reddy.C.V.K,Veeresh.D.J (2011)¹⁴ conducted a study to assess the oral health status and treatment needs of 144 fishermen in coastal village of Tirunelveli District in Tamilnadu. WHO oral health assessment form 1991 (modified) was used to assess oral health status. The results revealed that prevalence of periodontal disease more among fisherman (93.1%). Overall prevalence of Dental caries among fishermen was 54.9%. Mean DMFT values of fishermen was 3.61. Among the total study population, the treatment needed for extraction (39.6%), filling (20.8%), root canal treatment (11.8%). It was concluded that oral health status of fishermen population was relatively poor with caries prevalence and poor periodontal health when compared to non-fishermen population. Hazardous occupations, un scheduled working hours, job related stress, pernicious habits, irregular diet due to lack of availability of home cooked food, lower awareness levels and

socio-economic status seemed to influence the oral health status of fishermen population.

Amith.H.V,Decruz.A.M (2011)²⁶ conducted a study to determine the prevalence of Dental caries amongst 594 school going children of 12-15 years old of Waranagar, Maharashtra. The results revealed that prevalence of Dental caries across all ages was 64.98% with a mean DMFT of 1.92. Decayed component formed the majority (91.16%) of caries Index. Mean DMFT for females and males was 1.96 and 1.90 respectively. Mean DMFT for age 12 years was 1.44 while mean DMFT for 15 years was 1.74. It was concluded that there is a need for accessible and affordable oral health services to be provided to this community. Well planned school based oral health education program were needed to increase the oral health knowledge among the school children of this region.

Naveen kumar.B,Ramesh.N,Reddy.V (2011)²⁷ conducted a study to assess the prevalence of traumatic dental injuries to permanent incisors among 1020 school children of 12 year old in Tandoor, Andhrapradesh. WHO classification of tooth fractures (1978) was used. Results revealed that among 1020 children examined 515(51%) were boys and 505(49%) were girls. Traumatic dental injuries was found among 184(18.04%) of the school children. Boys had significantly higher (n= 121; 23.5%) prevalence as compared to girls (n= 63; 12.5%). It was concluded that prevalence of

traumatic dental injuries among 12 year old school children of Tandoor was significantly higher and was more in males compared to females.

Grover S, Anuradha P (2011)²⁸ conducted a study to assess the prevalence and treatment needs of Dental caries among 1040 school going children of which 527 children were of 12 years and 518 were of 15 years of age. The results revealed that prevalence of Dental caries in 12 years old children was 57.7% and in 15 years old was 48.5%. The mean DMFT for 12 years was 1.44 + 1.59 and mean DMFT for 15 years old children was 1.29 + 1.60. The treatment needs assessed were 48.2% females and 52.1% males amongst 12 years required one surface filling and amongst 15 years 43.2% females and 48.2% males required one surface filling. It was concluded that prevalence of Dental caries was high in school going children of this population and need for promotion of oral health and provision of availability of treatment to every child.

Pankaj S (2010)²⁹ conducted a study to assess the prevalence of malocclusion and orthodontic treatment needs among 1600, 12-15 years school children in Belgaum city, Karnataka. Dental Aesthetic Index (DAI) was used to assess the malocclusion status and orthodontic treatment needs. The results revealed that 29(1.8%) children had one or more missing teeth in maxillary and mandibular incisal segments. 617(26.5%) had either one or two segment crowding. 424(26.5%) had either one or two segment spacing. 202(12.6%) had a diastema equal to or more than 1 mm. 435(27.1%) children

had either half cusp or full cusp deviation. 1417(88.6%) children had a score less than or equal to 25, indicative of minor occlusion where there was no need for treatment. 109(6.8%) had a score between 26 to 30 indicative of definite malocclusion where treatment was elective. It was concluded that most of children 88.6% had a dental appearance (exhibited lower DAI score) which require no orthodontic treatment and 11.4% of children were in objective need of orthodontic treatment.

Senthilkumar M, Balagopal S, Reddy S, Venkatesh A (2011)³⁰ conducted a study to assess prevalence of Dental caries and treatment needs of 274 school children of age 5 to 12 years in Vandalur Taluk, Chennai. The results revealed that caries was more prevalent in girls than in boys (25% in girls and 10.44% in boys). Mean DMFT was 0.36 in 11-12 years old. Girls experienced higher rates of caries (0.19) than boys (0.15). It was concluded the necessity for accessible and affordable oral health services in the form of oral health education in community and school settings to create awareness.

Bhat P.K, Aruna C.N (2011)³¹ conducted a study to assess the prevalence of Dental caries among 414 school children of 10-12 years old in South Bangalore. Dental caries experience was assessed using DMFT indices. The results revealed 66.2% of school children were brushing twice daily and only 5.1 % of them had Dental caries, whereas 30.4% of them were brushing once daily and 38.1% of them had Dental caries. Around 15.7% of respondents were consuming sweets once a day and 50.8% of them had caries,

while 75.% of them were consuming sweets once in a week and 8.4% had caries. 76.3% of them were consuming milk with sugar but only 14.6% of them had caries. Near to 54% of participants consumed fresh fruits and only 14% of them had caries. It was concluded that changing life styles and dietary patterns are markedly increasing caries incidence. Children should be encouraged to brush twice daily and consumption of fresh fruits. Community based oral health promotion programmes could be initiated through healthy promoting school projects.

Stalin A, John J.B, Preethi V (2011)³² conducted a study to assess the diet pattern and caries prevalence of 230 school children aged 11-14 years in Tiruchengode, Tamilnadu. Diet diary was analyzed for sugar consumption according to method described by Nizel and Pappas. The results revealed that the sweet score for the sample ranged from $17.15 \pm 8.5/\text{day}$. Mean scores and standard deviations of Dental caries prevalence revealed DMFT score 1.11 ± 1.4 . The sweet score was found to be well above the 'watch-out zone'. 17.15 ± 8.5 and it indicates high caries risk. The oral hygiene practices among the school children was fair that 62.4% brush once daily, 36.5% twice daily. It was concluded that sticky form of sweets such as cocoa, chocolates, wafer chocolates and cream biscuits were concluded as most preferable and also available snacks items for children from this sub urban community that showed more significance in caries development.

Sujatha B,Saisankar A.J,Manojkumar M.G (2011)³³ conducted a study to assess the prevalence of Dental caries and treatment needs for 1862 school going children in age group between 7-12 years and 13-16 years in rural and urban areas government residential schools of Guntur district. WHO (1997) criteria was used for examination. Results revealed that overall prevalence of Dental caries in the study population was 45.91%. In rural population it was found that 7-12 years group had 47.75% of caries as compared to 51.84% 13-16 year age group. In both age groups, boys showed higher caries prevalence compared to girls. In urban population 7-12 year age group had 45.33% spread of caries compared to 37.02% in 13-16 year age group. In 7-12 years group, girls showed higher caries prevalence, whereas in 13-16 year age group boys showed more caries prevalence. The percentage of children requiring various type of dental caries treatment were more in rural areas(50.32%) when compared to rural area(45.52%). It was concluded the urgent need for extending the dental specialty to rural hospitals as the rural population showed unusual increase in prevalence of caries.

Ganesh A, Ingle N, Chaly P, Reddy C (2011)³⁴ conducted a study to assess the dental caries experience and frequency of sugar consumption and to correlate the relationship between the two factors in 1600 12 and 15 year old children in Chennai. A 24 hour diet recall and WHO (1997) form was used to assess dentition status and treatment needs. The results revealed that during a period of 24 hours, it was noted that only 46(2.9%) of subjects had no sugar

exposure. 303(18.9%) of children had one sugar exposure per day, 517(32.3%) had two exposures per day, 416(26%) had three sugar exposures, 217(13.6%) had four sugar exposures per day. The sweet score was excellent in 270(16.9%), good in 329(20.6%) however a majority 1001(62.6%) were in watch-out zone. Mean DMFT of 12 year old children was 0.85 ± 1.31 , while that of 15 year old children was 1.31 ± 1.73 . Mean DMFT of government school children was 1.24 ± 1.71 , while that of private school children was 0.92 ± 1.37 . Majority of subjects were free of traumatic teeth (93.4%). 82(5.1%) of students had one traumatized teeth. 707(44.4%) needed one surface filling, 248(15.5%) needed two surface fillings, 83(4.1%) required extraction and pulp care (2.9%). It was concluded that majority of subjects were in watch-out zone and two sugar exposures per day. Overall prevalence of Dental caries was 45.6%, while that of 12 years was 40.2% and 15 years was 51%. There was a positive correlation between DMFT with frequency of sugar exposures per day.

Mahesh kumar P, Joseph T, Varma R.B, Jayanthi M (2005)³⁵

conducted a study to assess the oral health status of 1200 school children of which 600 each in 5 and 12 years in Chennai city. The results revealed that among 12 year age group periodontal assessment using CPI (0= 11.2%, 1=51.3%, 2 = 37.5%). Among 600 12 years old, boys (317) were affected more than girls (283). Also, higher percentage of corporation school children had gingival and periodontal problems than private school children. In 12

years, the mean DMFT for boys was 3.80 ± 3.43 , girls 4.11 ± 2.98 . Overall prevalence of malocclusion was that both private and corporation school children showed mild to moderate degree of malocclusion. It was concluded that a study on oral health assessment and dental health education of children at an early age helps in improving preventive dental behavior and attitudes, which is beneficial for a life time. This can be achieved by educating the uneducated parents about dental health through school dental health program.

MATERIALS AND METHODS

1. BACKGROUND OF STUDY:

The present study was a descriptive cross sectional survey done to assess the oral health status and treatment needs of 12 and 15 year old school going children of fishermen community residing at East coast road, Kancheepuram, Tamilnadu. The study was carried out during December 2011 to April 2012.

2. BACKGROUND OF STUDY AREA:

Chennai located on the Coromandel Coast off the Bay of Bengal is a major commercial, cultural, and educational centre in South India with a Harbor being the second largest in India. As of the 2011 census, the city had 4.68 million residents making it the sixth most populous city in India and fourth most populous metropolitan area in the country. Marina Beach, which is an urban beach in the city of Chennai, runs a distance of 13 km making it the world's second longest beach.

East Coast Road (ECR) is a two lane highway, built along the coast of the Bay of Bengal connecting Chennai to Cuddalore via Pondicherry. The ECR starts at Kottivakkam in Chennai and is a part of the Greater Chennai City till Kovalam. There are totally 12 coastal villages in East coast road belonging to Greater Chennai. The occupation of coastal population is mainly fishing.

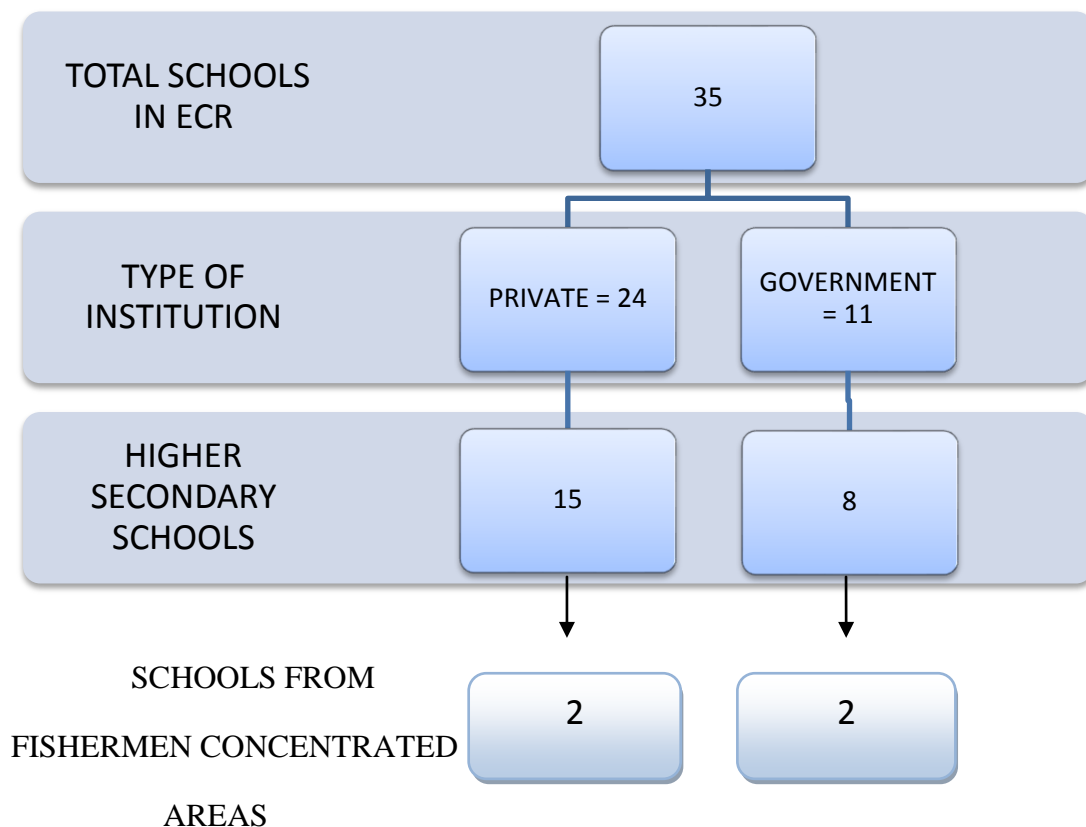
3. OBTAINING THE APPROVAL FROM AUTHORITIES:

Ethical clearance to conduct the study was obtained from the Institution Review Board of Ragas Dental College and Hospital (**Annexure I**). List of all the schools located along East coast road, Chennai was obtained from the office of the Chief educational officer (CEO), Kancheepuram district. The permission to conduct the study was obtained from the Chief educational officer (CEO) Kancheepuram and also from the respective school authorities (**Annexure II**).

4. STUDY POPULATION:

There were totally 35 schools in study area out of which 11 were Government schools and remaining 24 were private schools. From this list of schools, the higher secondary schools were alone segregated as the study population of 12 to 15 year old school going children can be obtained only from these schools. Among the Higher secondary schools, 2 government and 2 private schools were selected from areas, where more number of fishermen children were studying based on the data obtained from Office of Chief Educational Officer, Kancheepuram district and Assistant directorate of fisheries in Neelangarai, Chennai.

FLOW CHART:



5. INCLUSION AND EXCLUSION CRITERIA:

INCLUSION CRITERIA

1. Those Children, whose parents involved in fishing as primary occupation obtained with the help of school records and who were present on day of examination were included in the study.
2. Those children who were willing to participate in the study.

EXCLUSION CRITERIA

1. Those children who were absent during the time of examination were excluded.

6. SAMPLE SIZE DETERMINATION:

PILOT STUDY:

A pilot study was undertaken in February 2012 at St. Joseph school, Kovalam to determine the feasibility of the study and also to determine the sample size. The study population included were 74 Fishermen children of 12 and 15 years old.

Closed-ended questionnaire consisting of demographic data and nine questions, in which section 1 dealt with perceived dental health and utilization of dental services, section 2 dealt with oral hygiene practices, section 3 dealt with 24 hours-Diet chart for calculating sweet score, amount of fish intake and source of drinking water. WHO oral health assessment proforma 1997 was used to assess the oral health status and treatment needs excluding prosthetic treatment needs. It took an average of 10-15 minutes to complete the proforma and questionnaire.

As per the pilot study, the prevalence of dental caries was found to be 68 % and it was taken for sample size calculation.

SAMPLE SIZE DETERMINATION:

The sample size for the present study was calculated based on the data collected from the pilot study. Accordingly, the prevalence of dental caries was found to be 68% that is, 51 out of 74 children had caries experience. Thus the sample proportion is 0.68. The sample size was calculated by fixing the probability of Type I error at 5% and that of Type II error at 10%. The study's power was set at 90%. All these data were fed in a special software for sample size determination namely n-MASTER. It was found that the minimum sample size required was 590 assuming the population proportion as 0.74. A non-response rate of 10% was anticipated prior for the main study and hence the sample size was increased by 10%. Thus the final sample size was calculated as follows:

$$= 590 + (10\% \text{ of } 590)$$

$$= 590 + 59$$

$$= 649$$

$$\approx 650 \text{ students.}$$

STUDY SAMPLE AND SAMPLING PROCEDURE

The study sample for the present study was selected using convenient sampling method.

7. IMPLEMENTING THE STUDY

a. PROFORMA and DATA COLLECTION

Data was collected from a cross-sectional survey, using a Survey Proforma which comprised of a Questionnaire, and Clinical examination.

(i) QUESTIONNAIRE AND DEMOGRAPHIC DATA

Closed-ended questionnaire demographic data and consisting of 9 questions, in which section 1 dealt with perceived dental health and utilization of dental services, section 2 dealt with oral hygiene practices, section 3 dealt with 24 hours-Diet chart for calculating sweet score, amount of fish intake and source of drinking water (**Annexure III**). WHO oral health assessment proforma 1997 was used to assess the oral health status and treatment needs was collected from the individuals prior to the clinical examination (**Annexure IV**).

(ii) CLINICAL EXAMINATION

An intra-oral examination was carried out by a single examiner to assess the Oral Health Status and treatment needs using WHO Oral Health Surveys – Basic Methods Proforma (1997) excluding prosthetic treatment needs. Calibration of the examiner was assessed by kappa statistic and interpreted to be 0.83.

b. EXAMINATION AREA

Type III Examination was conducted under bright natural light, by positioning the subject as to receive sufficient daylight.

c. EXAMINATION POSITION

The subjects were made to sit on a chair with comfortable arm rest facing the light in an upright position with sufficient head rest. The examiner was seated to right of the subject. The trained data recorder was seated on the left side of the patient, so that data recorder was able to hear the examiner's instructions and codes and also the examiner was able to see the data being entered.

d. INSTRUMENTS AND MATERIALS USED

Examination was carried out with the help of the following:

- ◆ Mouth mirrors
- ◆ CPI probe
- ◆ Cotton rolls
- ◆ Kidney trays
- ◆ Sterilizing solution
- ◆ Chip blower
- ◆ Cotton holder
- ◆ Disposable gloves and masks

During data collection, chemical method of disinfection and sterilization using Korsorex (Glutaraldehyde- 7gms; Polymethyl urea derivatives- 11.6 gms; 1, 6dihydroxy 2, 5droxyhexane - 8.2gm) diluted by adding water was used. Used instruments were washed and placed in the disinfectant solution (for 30 minutes), then re-washed and drained well. After each day of examination, the entire set of instruments was autoclaved.

VIII. EXAMINATION, ORAL HEALTH EDUCATION AND TREATMENT REFERRAL

A single classroom was provided in each school and each child was examined for 15 minutes, after the questionnaire was completed. Around 30 children approximately were examined per day. Children with their parent's occupation as fishing were asked to come in class section-wise with their class teacher. Questionnaire was distributed to the children and the examiner explained the questions in their local language. Structured diet chart which includes the quantity of Milk, Fruit Juices, Chocolates and Sweets were elicited. After completion of the questionnaire, the examiner collected the questionnaire and examined the oral cavity and recorded the findings in WHO proforma 1997. After the oral examination, a brief oral health education session was conducted in the local language Tamil to all the Fishermen children and class teacher of the respective section with the help of Tooth models and posters.

The findings of the survey were reported to the Head mistress and those requiring treatment were provided free treatment by arranging Dental Camp which was organized by Ragas Dental College and Hospital. Children who required further dental treatment were referred to Ragas Dental College & Hospital for dental treatment.

IX. STATISTICAL ANALYSIS:

The data recorded were transferred and tabulated to the computer - Windows Microsoft Excel (2007) - for the purpose of the data analysis. The Chi-square test (χ^2) was used to find out whether there existed a significant difference in the oral health status between 12 years old and 15 years old school children and Private and Government school children.

PHOTOGRAPHS

Photograph 1: Oral Examination



Photograph 2: Armamentarium



RESULTS

The present study was done to assess the oral health status and treatment needs of 12 and 15 years old school going children of Fishermen community residing at East Coast Road, Chennai.

Table 1, Graph 1 shows the distribution of study population based on age, Gender and type of Institution Among private school children, 181 (51.7%) were 12 years old and 149 (29.9%) were 15 years old, while among Government school children 169 (48.2%) were 12 years old and 151 (50.3%) were 15 years old.

Table 1: Distribution of study population based on age and Gender

Type of Institution Age	Private school		Government school		Total
	Male	Female	Male	Female	
12 years	73	108	116	53	350
15 years	109	40	46	105	300

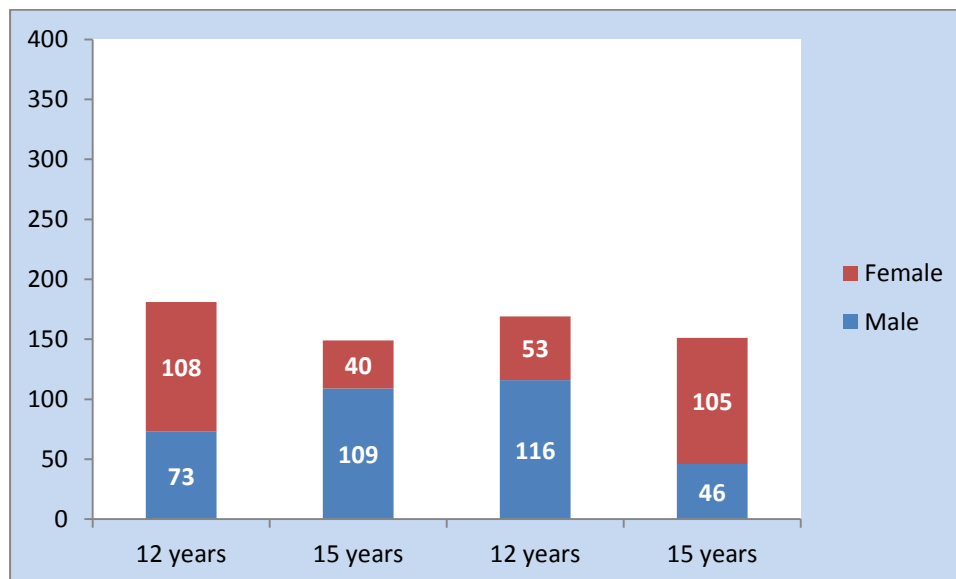
Graph 1: Distribution of study population based on Age and Gender**PRIVATE SCHOOL****GOVERNMENT SCHOOL**

Table 2, Graph 2 shows the distribution of study population based on satisfaction on appearance of teeth. Among the total study population 419(64.5%) were satisfied with appearance of their teeth, of which 226(64.6%) were 12 years and 193 (64.3%) were 15 years old.

Statistical test showed that there exists significant difference with respect to satisfaction of appearance of teeth between 12 and 15 year old students studying in private and Government schools.

Table 2: Distribution of study population based on satisfaction on appearance of teeth

Satisfaction on teeth appearance	Private school*		Government school*		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
Yes	102(15.7%)	86(13.2%)	124(19.1%)	107(16.5%)	419(64.5%)
No	79(12.2%)	63(9.7%)	45(6.9%)	44(6.8%)	231(35.5%)

{[#] $\chi^2 = 16.709$; P = 0.001(significant)} {^{*} $\chi^2 = 3.516$; P = 0.61}

Graph 2: Distribution of study population based on satisfaction on appearance of teeth

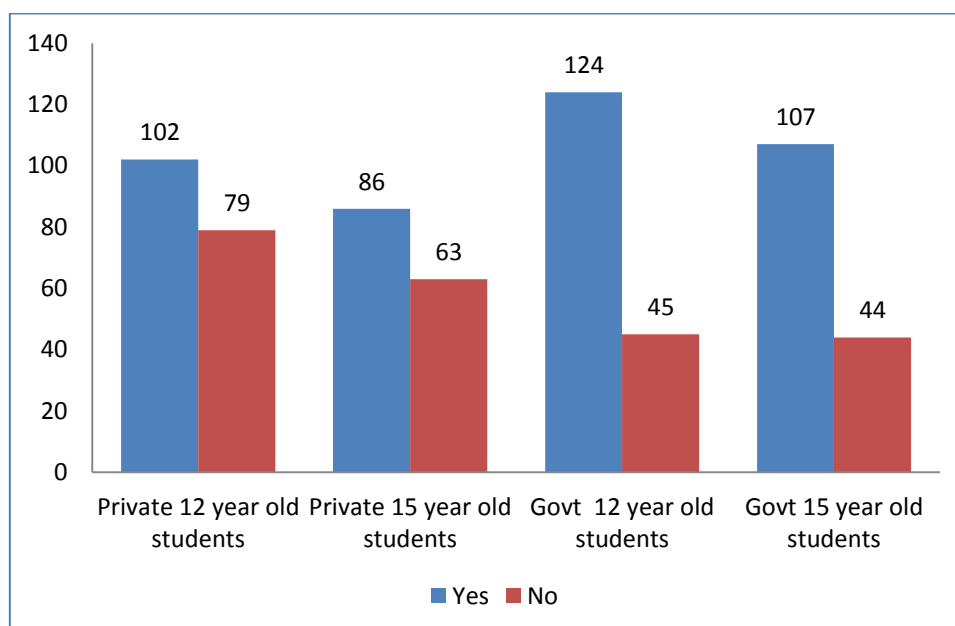


Table 3, Graph 3 shows 323 children(49.7%) of total study population had tooth ache or discomfort in their teeth, of which 156 (44.6%) were 12 years and 167 (55.7%) were 15 years old.

Statistical test showed that there exists significant difference with respect to Pain in teeth between 12 and 15 year old students studying in private and Government schools.

Table 3: Distribution of study population based on Tooth ache or discomfort in teeth

Pain in teeth	Private school*		Government school*		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
Yes	91(14%)	77(11.8%)	65(10%)	90(13.8%)	323(49.7%)
No	90(13.8%)	72(11.1%)	104(16%)	61(9.4%)	327(50.3%)

{[#] $\chi^2 = 14.719$; P = 0.002(Significant)}{* $\chi^2 = 7.728$; P = 0.005(Significant)}

Graph 3: Distribution of study population based on Tooth ache or discomfort in teeth

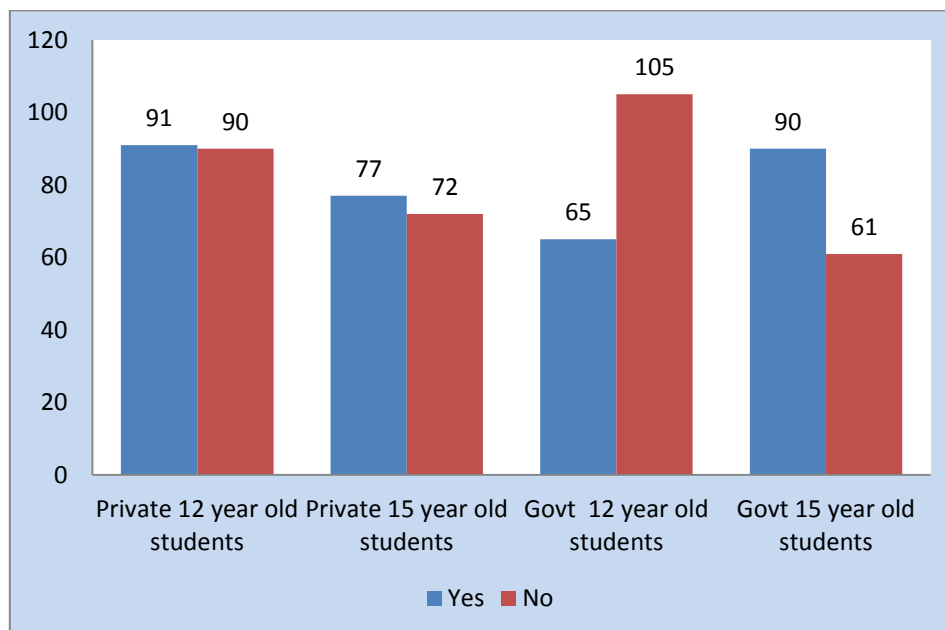


Table 4, Graph 4(a) and 4(b) shows that only 226(34.8%) of the total study population have visited dentist during past 12 months. However, there was no difference among 12 years old 118(33.7%) and 15 years old 108(36%) in visiting dentist during past 12 months. 63 children from 12 years and 70 children from 15 years had visited dentist for Tooth ache. 23 children from 12 years and 17 children from 15 years had visited dentist for Extraction, while 39 children from 12 years and 25 children from 15 years old had visited dentist for restoration.

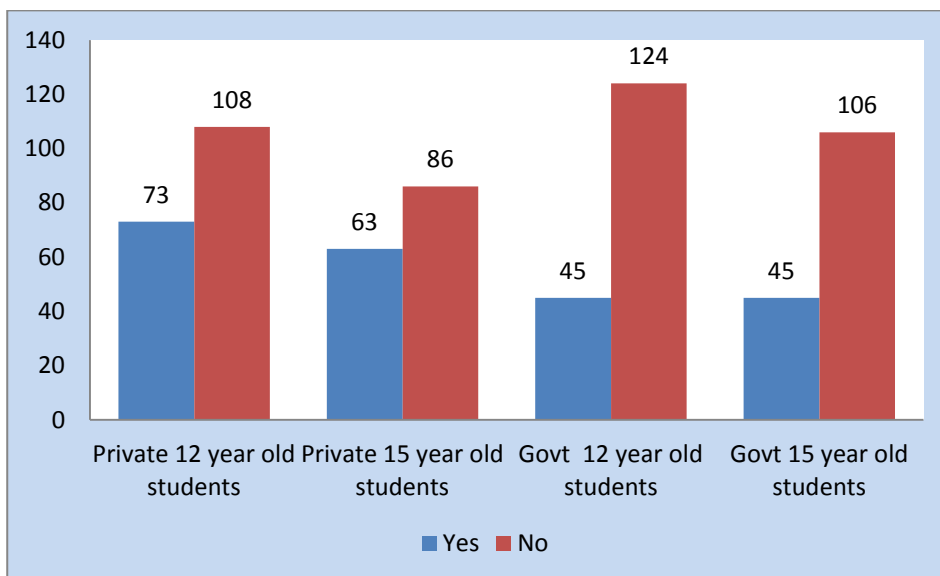
Statistical test showed that there exists significant difference with respect to Pain in teeth between 12 and 15 year old students studying in private and Government schools.

Table 4: Distribution of study population based on visited Dentist during past 12 months

Past Dental visit	Private school*		Government school*		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
Yes	73(11.2%)	63(9.7%)	45(6.9%)	45(6.9%)	226(34.8%)
No	108(16.6%)	86(13.2%)	124(19.1%)	106(16.3%)	424(65.2%)

{[#] $\chi^2 = 12.760$; P = 0.005 (significant)} {* $\chi^2 = 2.140$; P = 0.143}

Graph 4(a): Distribution of study population based on visited Dentist during past 12 months



Graph 4(b): Distribution of study population based on reason for last Dental visit

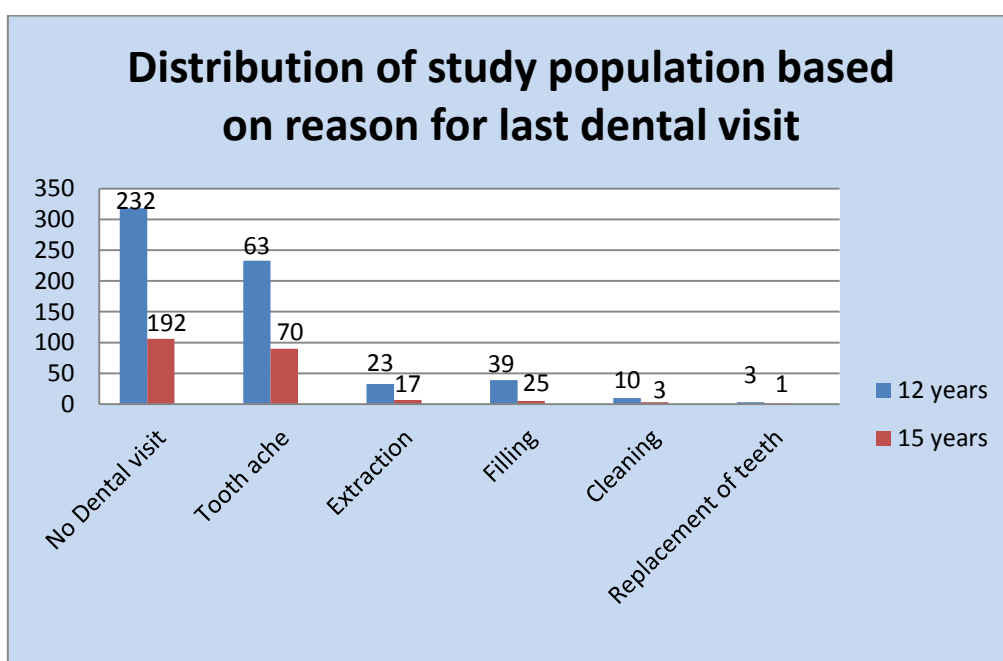


Table 5, Graph 5 shows that most of the study population 648(99.7%) had the habit of brushing.

Statistical test showed that there is no significant difference with respect to Habit of brushing between 12 and 15 year old students studying in private and Government schools.

Table 5: Distribution of study population based on Brushing Habit

Habit of Brushing	Private school*		Government school		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
Yes	181(27.8%)	149(22.9%)	167(25.7%)	151(23.2%)	648(99.7%)
No	0(0%)	0(0%)	2(0.3%)	0(0%)	2(0.3%)

{[#] $\chi^2 = 5.710$; P = 0.127(Not significant)} {* $\chi^2 = 0.607$; P = 0.436}

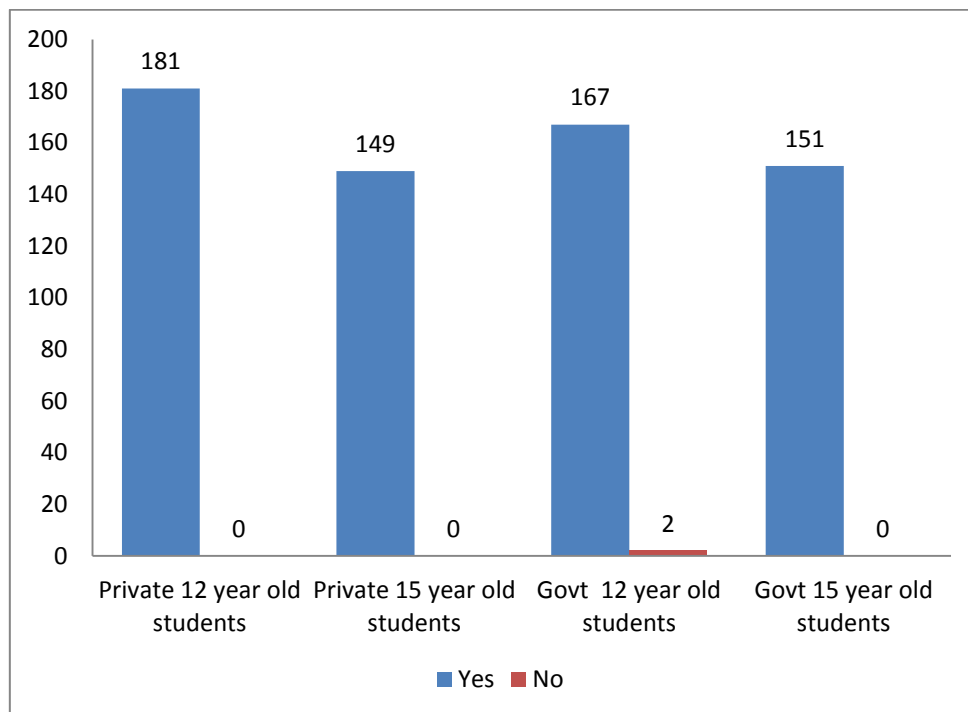
Graph 5: Distribution of study population based on Brushing Habit

Table 6, Graph 6 shows that majority of the study population 470(72.3%) were brushing once a day which includes 257students among 12 years old children and 213 students among 15 years old children.

Statistical test showed that there is no significant difference with respect to Frequency of brushing between 12 and 15 year old students studying in private and Government schools.

Table 6: Distribution of study population based on frequency of brushing their teeth

Frequency of Brushing	Private school*		Government school		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
Once daily	129(19.8%)	98(15.1%)	128(19.7%)	115(17.7%)	470(72.3%)
Twice or more	52(8%)	51(7.8%)	41(6.3%)	36(5.5%)	180(27.7%)

{[#] $\chi^2 = 5.389$; $P = 0.145$ (Not significant)} { * $\chi^2 = 1.457$; $P = 0.227$ }

Graph 6: Distribution of study population based on frequency of brushing their teeth

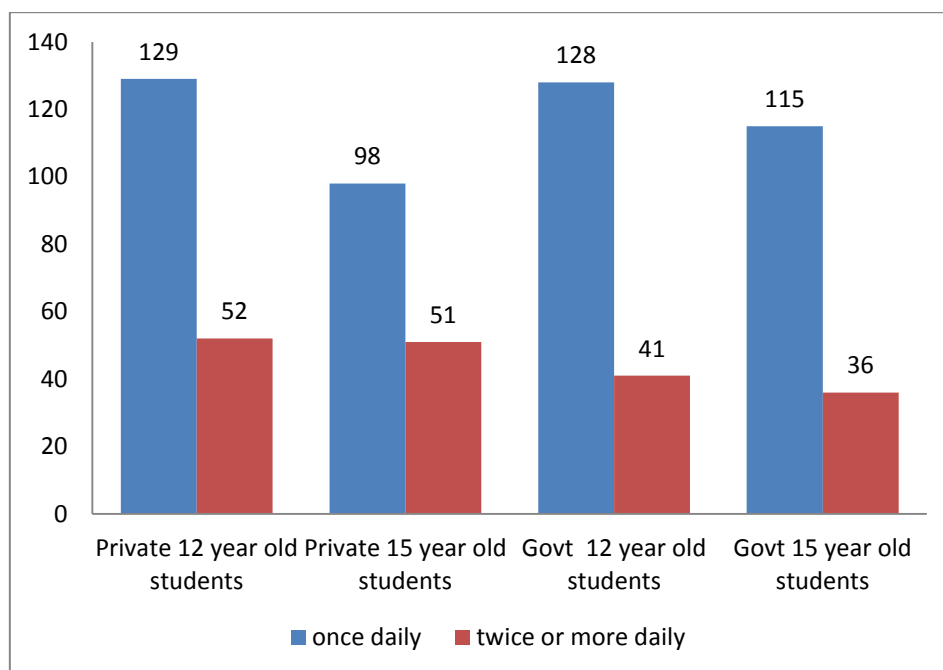


Table 7, Graph 7 shows distribution of study population based on Brushing aids used. Among the total study population, 646(99.4%) were using Tooth brush and tooth paste and 4(0.6%) were using Finger and tooth powder.

Statistical test showed that there is no significant difference with respect to Brushing aids used between 12 and 15 year old students studying in private and Government schools.

Table 7: Distribution of study population based on Brushing aids used

Brushing aids used	Private school*		Government school*		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
Tooth brush and paste	180(27.7%)	149(22.9%)	166(25.5%)	151(23.2%)	646(99.4%)
Finger and tooth powder	1(0.2%)	0(0%)	3(0.5%)	0(0%)	4(0.6%)

{[#] $\chi^2 = 5.586$; P = 0.134} {* $\chi^2 = 1.218$; P = 0.270}

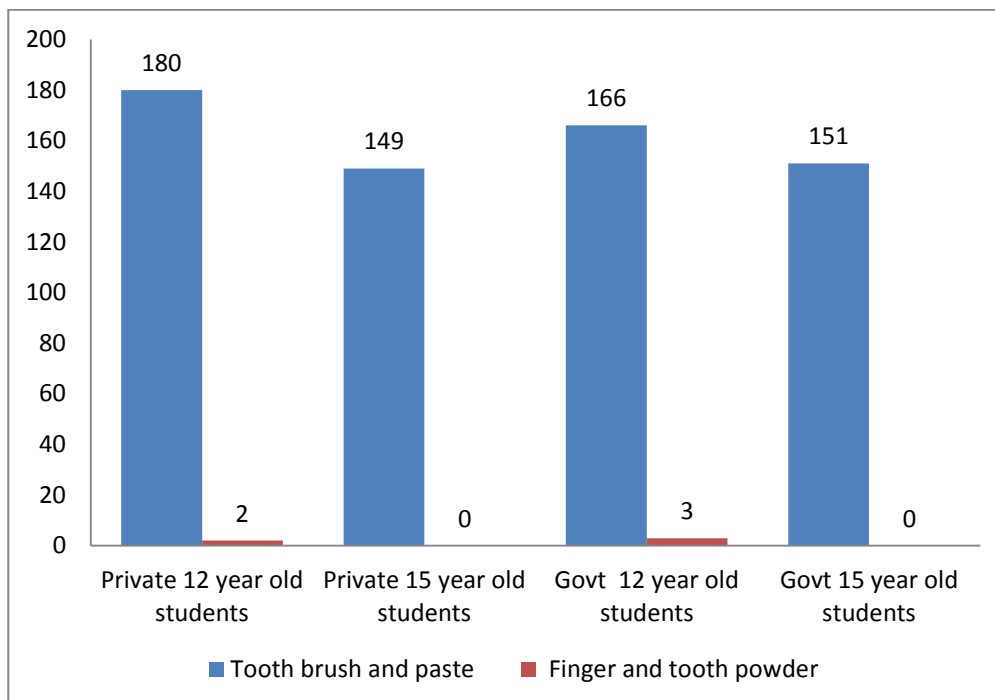
Graph 7: Distribution of study population based on Brushing aids used

Table 8, Graph 8 shows distribution of study population based on Sweet score. Among the 12 year old school children, 53(15.1%) had excellent sweet score, 97(27.7 %) had good sweet score and 200(57.7%) were in watch-out zone. Among the 15 year old school children, 55(18.3%) had excellent sweet score, 94 (31.3%) had good sweet score and 151 (50.3 %) were in watch-out zone.

Statistical test showed that there is no significant difference with respect to Sweet score between 12 and 15 year old students studying in private and Government schools.

Table 8: Distribution of study population based on Sweet score

SWEET SCORE	Private school*		Government school*		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
Excellent	32(4.9%)	27(4.2%)	21(3.2%)	28(4.3%)	108(16.6%)
Good	52(8%)	43(6.6%)	45(6.9%)	51(7.8%)	191(29.4%)
Watch-out zone	97(14.9%)	79(12.2%)	103(15.8%)	72(11.1%)	351(54%)

{[#] $\chi^2 = 6.576$; P = 0.362} {* $\chi^2 = 1.072$; P = 0.018}

Graph 8: Distribution of study population based on Sweet score

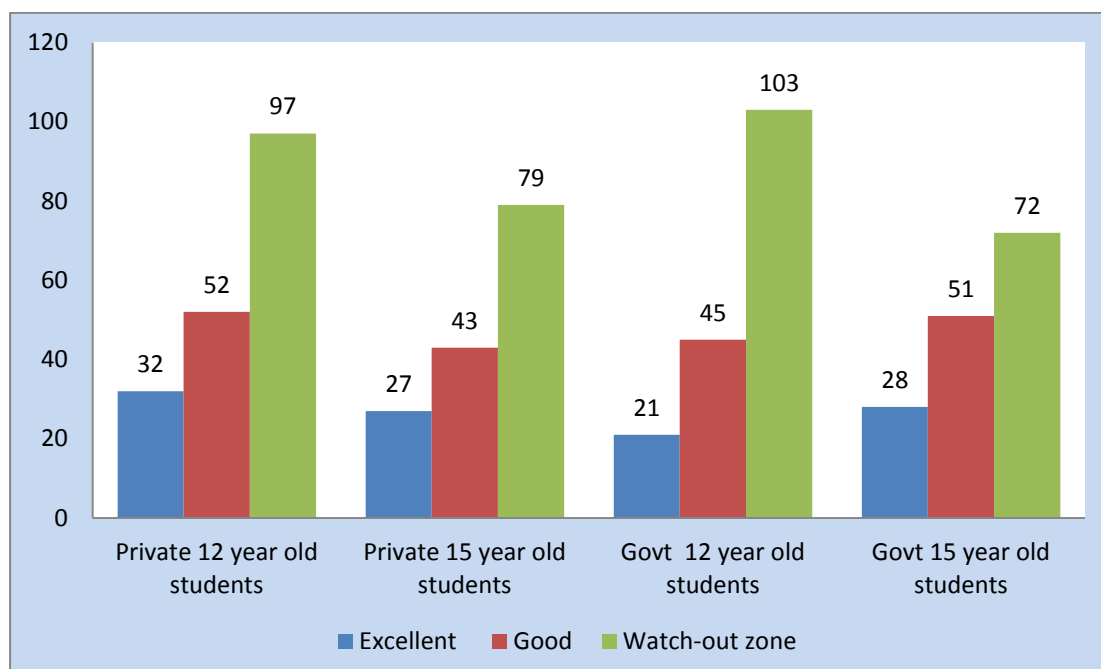


Table 9, Graph 9 shows distribution of study population based on frequency of Fish Intake. Among the 12 years old children, 115(32.9%) were taking fish daily, 120 (34.3%) were taking fish more than 3 days in a week, 109(31.1%) were taking fish less than 3 days in a week and 5(1.4%) never took fish. Among the 15 years old children, 107 (35.7 %) were taking fish daily, 122 (40.7%) were taking fish more than 3 days in a week, 64 (21.3%) were taking fish less than 3 days in a week and 7(2.3%) never took fish.

Statistical test showed that there exists significant difference with respect to Fish intake between 12 and 15 year old students studying in private and Government schools.

Table 9: Distribution of study population based on frequency of Fish Intake

Frequency of Fish intake	Private school*		Government school*	
	12 years [#]	15 years [#]	12 years [#]	15 years [#]
Daily	70(10.8%)	43(6.6%)	45(7%)	64(9.8%)
More than 3 days in a week	67(10.3%)	66(10.2%)	53(8.2%)	56(8.6%)
Less than 3 days in a week	43(6.6%)	37(5.7%)	66(10.2%)	27(4.2%)
Never	1(0.2%)	3(0.5%)	4(0.6%)	4(0.6%)

{[#] $\chi^2 = 31.838$; P = 0.001(Significant)} {* $\chi^2 = 2.064$; P = 0.048}

Graph 9: Distribution of study population based on frequency of Fish Intake

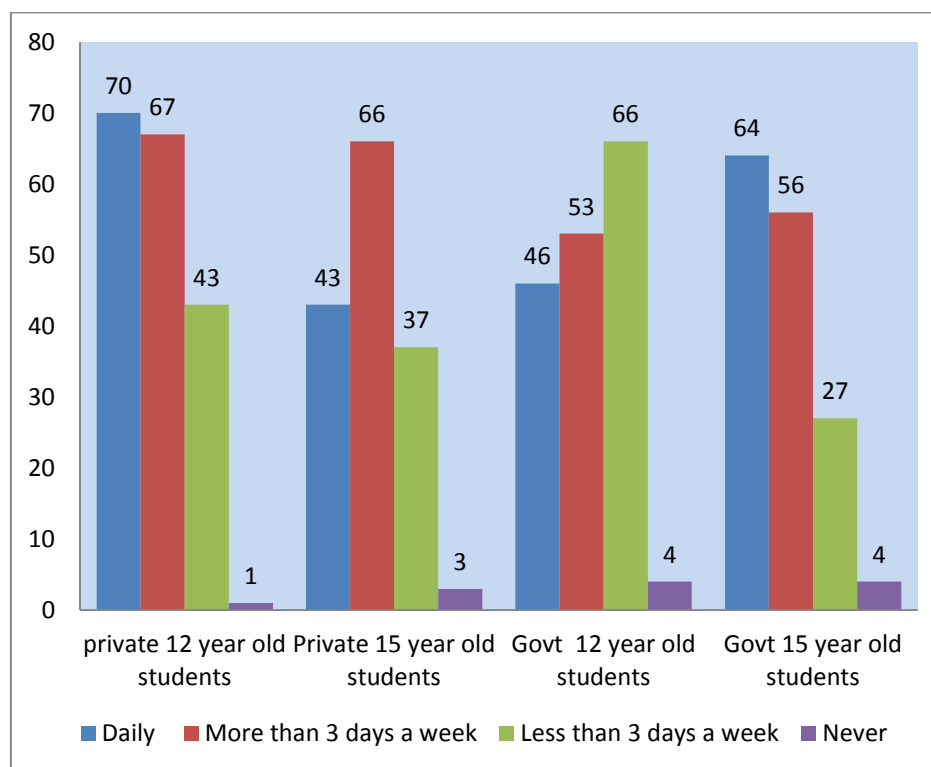


Table 10, Graph 10 shows distribution of study population based on source of drinking water. Among the total study population, 282(43.4%) were taking packaged drinking water, 288(44.3%) were taking corporation water and 80(12.3%) were taking Bore well water.

Statistical test showed that there exists significant difference with respect to source of drinking water used between 12 and 15 year old students studying in private and Government schools.

Table 10: Distribution of study population based on source of drinking water

Source of drinking water	Private school*		Government school*		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
Packaged drinking water	90(13.8%)	67(10.3%)	80(12.3%)	45(6.9%)	282(43.4%)
Corporation water	76(11.7%)	63(9.7%)	73(11.2%)	76(11.7%)	288(44.3%)
Bore well water	15(2.3%)	19(2.9%)	16(2.5%)	30(4.6%)	80(12.3%)

{[#] $\chi^2 = 20.954$; P = 0.002(Significant)} { * $\chi^2 = 9.901$; P = 0.007 }

Graph 10: Distribution of study population based on source of drinking water

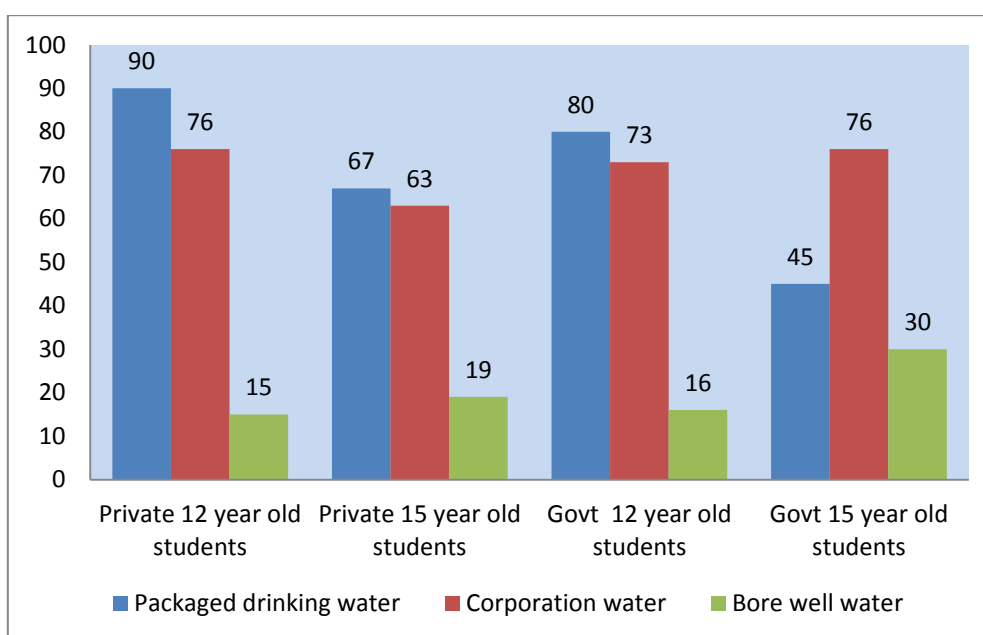


Table 11, Graph 11 shows distribution of study population based on TMJ symptoms, clicking, tenderness, and reduced jaw mobility. Among the total study population, almost 647(99.6%) had no TMJ symptoms and only 3 students had clicking

Statistical test showed that there is no significant difference with respect to TMJ symptoms between 12 and 15 year old students studying in private and Government schools.

Table 11: Distribution of study population based on TMJ symptoms (clicking, tenderness, and reduced jaw mobility)

TMJ symptoms	Private school*		Government school*		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
Clicking					
Yes	3(1.6%)	0(0%)	0(0%)	0(0%)	3(0.4%)
No	178(98.3%)	149(100%)	169(100%)	151(100%)	647(99.6%)

{[#] $\chi^2 = 3.368$; P = 0.338} {* $\chi^2 = 0.912$; P= 0.340}

Graph 11: Distribution of study population based on TMJ symptoms, clicking, tenderness, and reduced jaw mobility

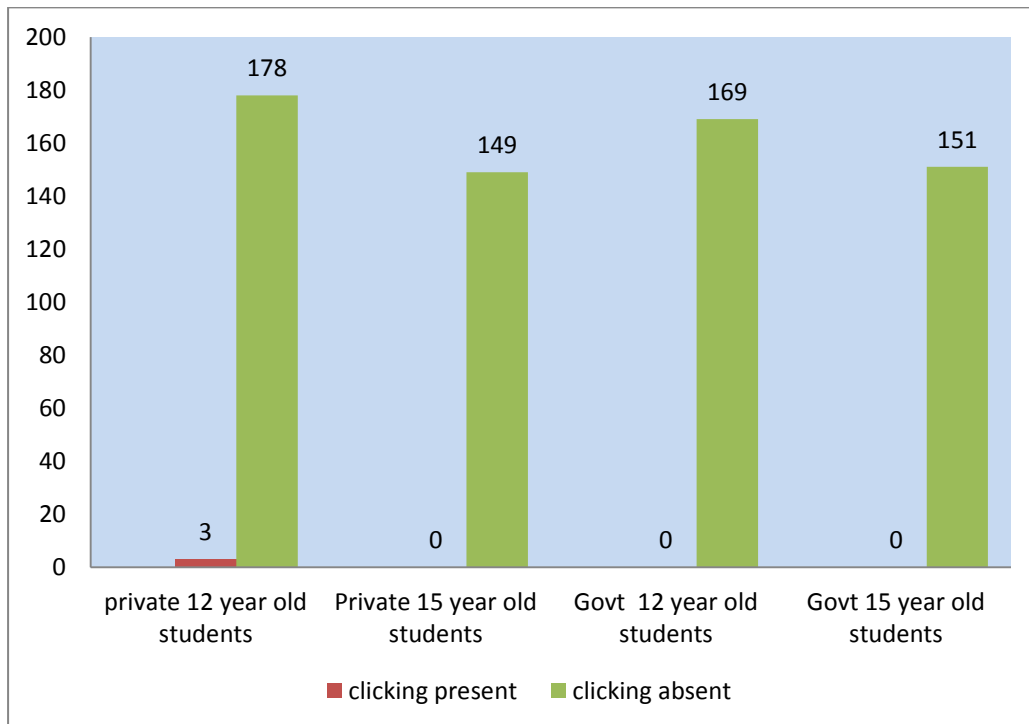


Table 12, Graph 12 shows distribution of study population based on oral mucosa condition. Only 3(0.4%) children of 12 year old had ulcerations in their mouth.

Statistical test showed that there is no significant difference with respect to Oral mucosa condition between 12 and 15 year old students studying in private and Government schools.

Table 12: Distribution of study population based on Oral Mucosa condition

Oral Mucosa condition	Private school*		Government school*		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
No Abnormal condition	180(27.6%)	149(22.9%)	167(25.6%)	151(23.2%)	47(99.6%)
Present	1(0.1%)	0(0%)	0(0%)	2(0.3%)	(0.4%)

{[#] $\chi^2 = 3.341$; P = 0.342} {^{*} $\chi^2 = 6.630$; P = 0.010}

Graph 12: Distribution of study population based on Oral Mucosa condition

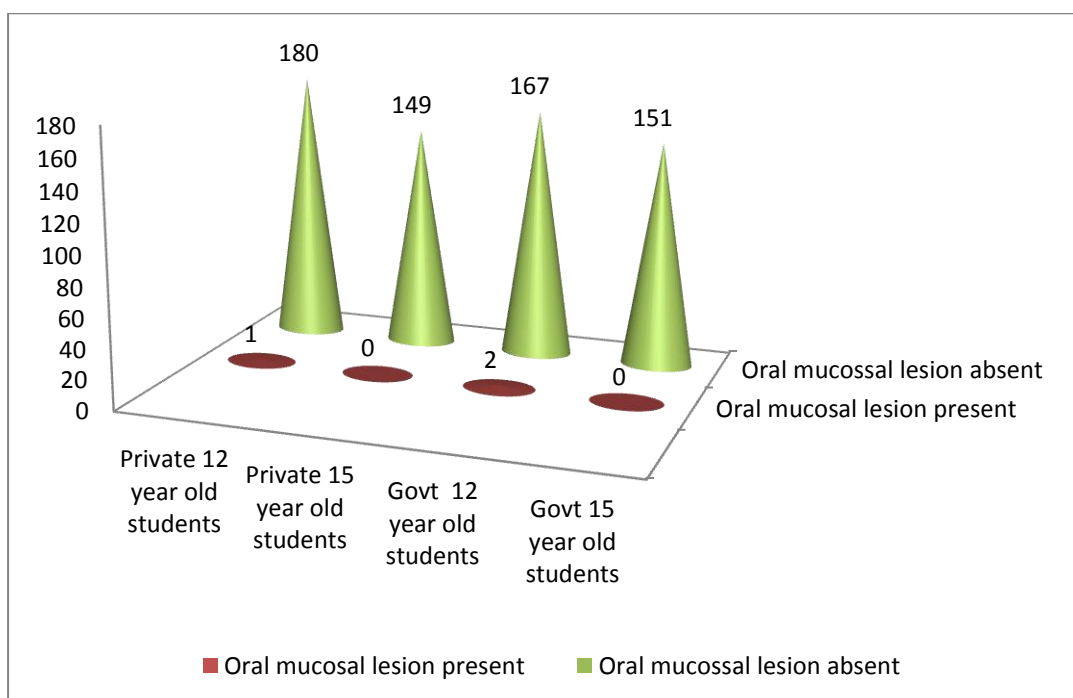


Table 13, Graph 13 shows distribution of study population based on Enamel Opacities. Among the total study population, majority 607(93.4%) had no Enamel opacity, while 24(6.9%) of 12 years old and 18(6%) of 15 years old had demarcated opacity.

Statistical test showed that there is no significant difference with respect to Enamel opacities between 12 and 15 year old students studying in private and Government schools.

Table 13: Distribution of study population based on Enamel Opacities

Enamel opacity	Private school*		Government school*		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
No enamel opacity	172(26.5%)	143(22%)	153(23.5%)	139(21.4%)	607(93.4%)
Demarcated opacity	9(1.4%)	6(0.9%)	15(2.3%)	12(1.8%)	42(6.5%)
Diffuse opacity	0(0%)	0(0%)	1(0.2%)	0(0%)	1(0.2%)

{[#] $\chi^2 = 7.209$; P = 0.302} {* $\chi^2 = 1.012$; P = 0.603}

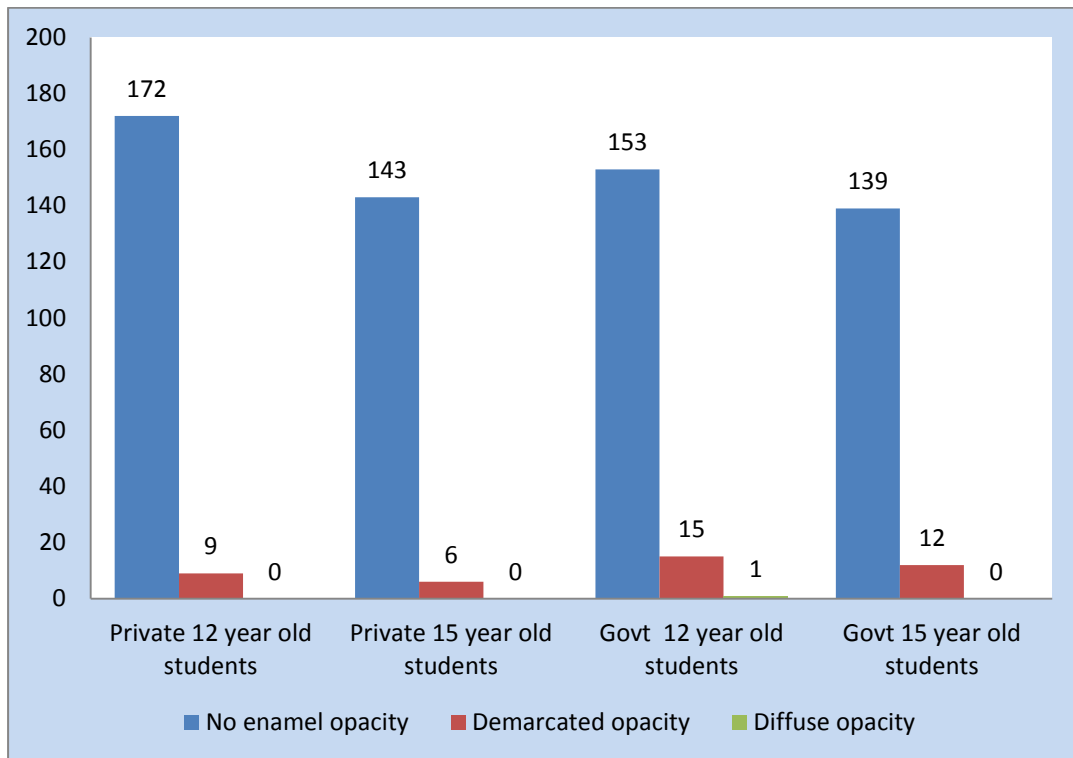
Graph 13: Distribution of study population based on Enamel Opacities

Table 14, Graph 14 shows distribution of study population based on Dental Fluorosis. Among the total study population, 16(2.5%) had Questionable fluorosis, while 2(0.3%) had mild fluorosis.

Statistical test showed that there is no significant difference with respect to Dental fluorosis between 12 and 15 year old students studying in private and Government schools.

Table 14: Distribution of study population based on Dental Fluorosis

Dental Fluorosis	Private school*		Government school*		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
No Dental fluorosis	176(27.1%)	145(22.3%)	164(25.2%)	147(22.6%)	632(97.2%)
Questionable fluorosis	5(0.8%)	3(0.5%)	5(0.8%)	3(0.5%)	16(2.5%)
Mild fluorosis	0(0%)	1(0.2%)	0(0%)	1(0.2%)	2(0.3%)

{[#] $\chi^2 = 2.831$; P = 0.830} {^{*} $\chi^2 = 0.984$; P = 0.611}

Graph 14: Distribution of study population based on Dental Fluorosis

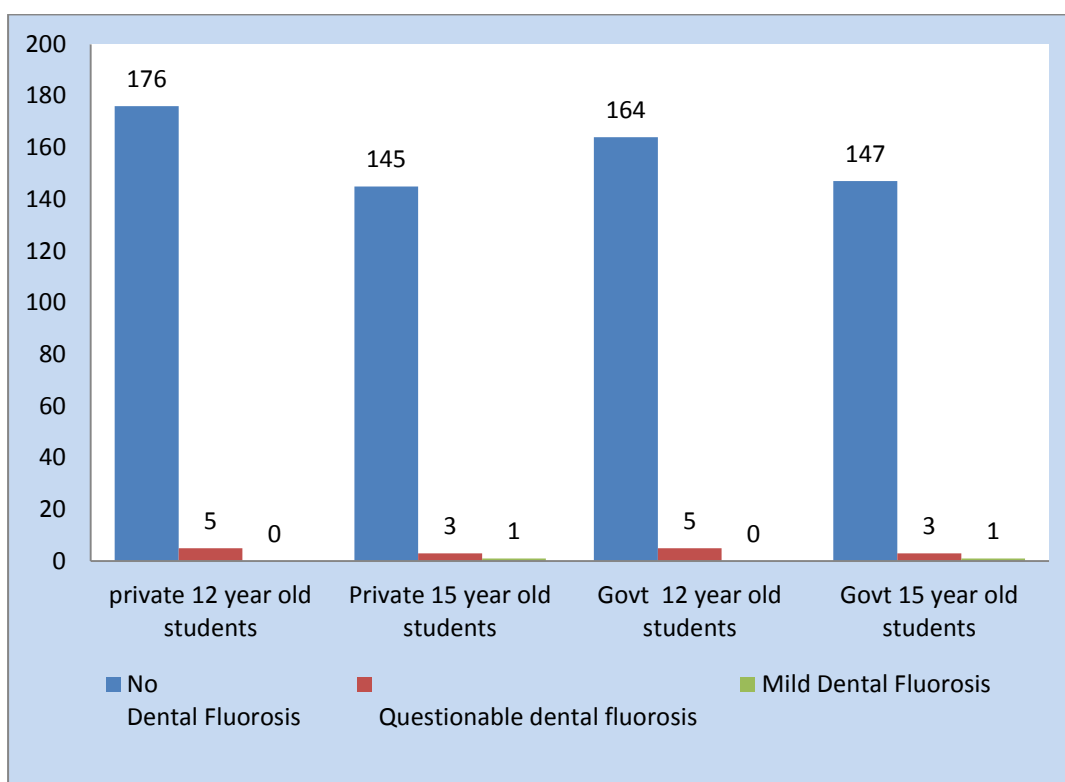


Table 15, Graph 15 shows distribution of study population based on CPI index. Majority of the study population 623(95.8%) had CPI score of 2 (ie., calculus), while only 27(4.1%) of the study population had CPI score of 0 (ie., healthy gums).

Statistical test showed significant difference between Age and Highest CPI code

Table 15: Distribution of study population based on CPI index

AGE	NO.OF EXAMINED	NO. OF DENTATE PERSONS	% PERSONS CODED				
			H	B	C	P1	P2
12 & 15 YEARS	650	650	4.1%	0	95.8%	0	0

{ $\chi^2 = 4.7$; $P = 0.02$ (Significant)}.

Graph 15: Distribution of study population based on CPI index

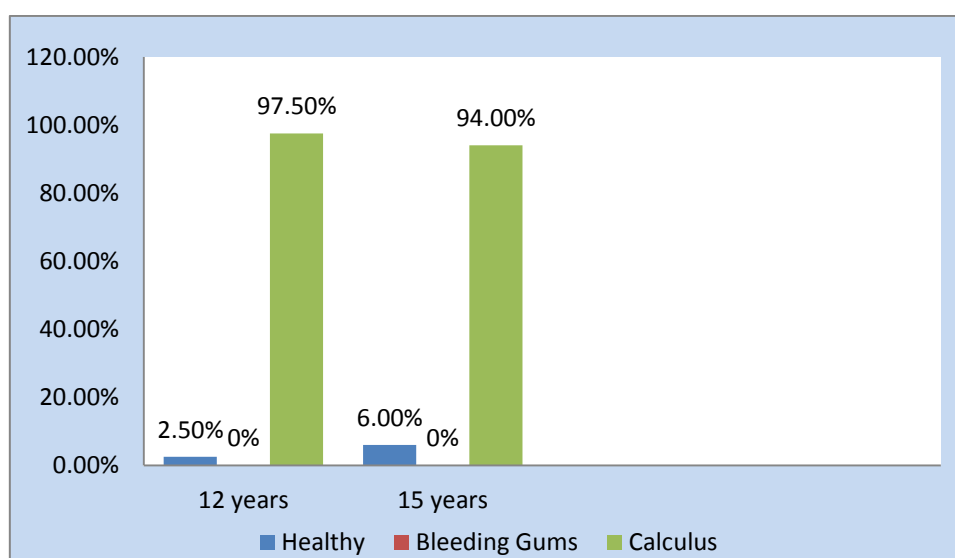


Table 16, Graph 16 shows distribution of study population based on Crown Status. 511 children (266(76%) 12 year old and 245(82%) 15 year old) had decayed teeth. 4(1.1%) 12 year old children and 2(0.6%) 15 year old children had filled teeth with decay. 9(2.5%)

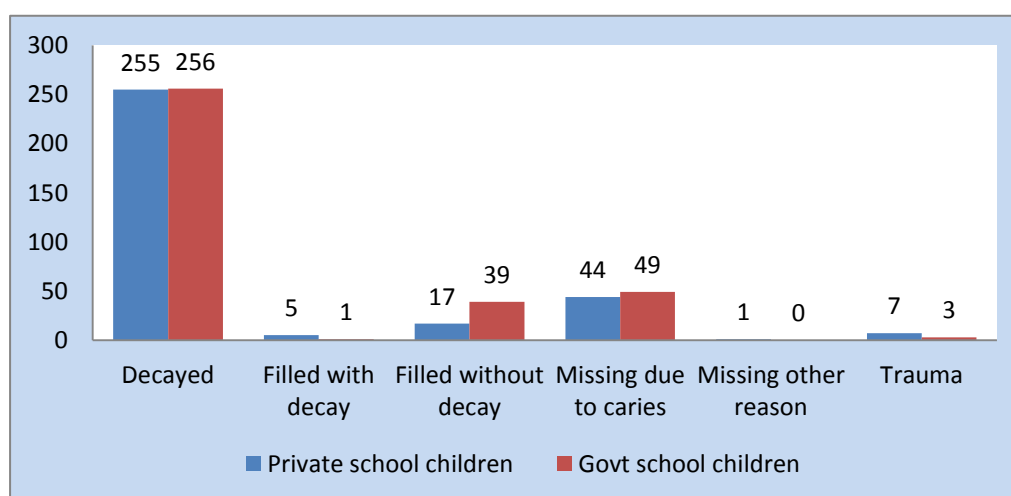
12 year old children and 47(15.6%) 15 year old children had filled teeth. 30(8.5%) 12 year old children and 97(32.3%) 15 year old children had missing teeth due to caries. 1(0.1%) child had missing due to reason other than caries. 6(1.7%) 12 year old children and 4(1.3%) 15 year old children had fractured teeth.

Table 16: Distribution of study population based on Crown Status

	Private school		Government school		Total
	12 years	15 years	12 years	15 years	
Decayed					
Yes	142(78.5%)	113(75.8%)	124(73.4%)	132(87.4%)	511(78.6%)
No	39(21.5%)	36(24.2%)	45(26.6%)	19(12.6%)	139(21.4%)
Filled with decay					
Yes	3(1.6%)	2(1.3%)	1(0.6%)	0(0%)	6(0.9%)
No	178(98.4%)	147(98.7%)	168(99.4%)	151(100%)	644(99.1%)
Filled without decay					

Yes	6(3.3%)	11(7.4%)	3(1.8%)	36(23.8%)	56(8.6%)
No	175(96.1%)	138(92.6%)	166(98.2%)	115(76.2%)	594(91.4%)
Missing due to caries					
Yes	16(8.8%)	28(18.8%)	7(4.1%)	42(27.8%)	93(14.3%)
No	165(90.6%)	121(81.2%)	162(95.9%)	109(72.2%)	557(85.7%)
Missing other reason					
Yes	1(0.6%)	0(0%)	0(0%)	0(0%)	1(0.1%)
No	180(99.4%)	149(100%)	169(100%)	151(100%)	649(99.9%)
Trauma					
Yes	3(1.7%)	4(2.7%)	3(1.8%)	0(0%)	10(1.5%)
No	178(98.3%)	145(97.3%)	166(98.2%)	149(100%)	640(98.5%)

Graph 16: Distribution of study population based on Crown



Status

Table 17 shows distribution of study population based on root status of children. Among the study population, 4(0.6%) children, (3(0.8%) 12 year old children and 1(0.3%) 15 year old child) had decayed root.

Table 17: Distribution of study population based on Root status

	Private school		Government school		Total
	12 years	15 years	12 years	15 years	
Root Decay	2(1.1%)	1(0.7%)	1(0.6%)	0(0%)	4 (0.6%)
Root Unexposed	179 (98.9%)	148 (99.3%)	168 (99.4%)	151 (100%)	646 (99.4%)

Table 18, Graph 17 shows distribution of study population based on Treatment needs. Majority of the study population 454 (241(68.8%) 12 year old children and 213(71%) 15 year old children need one surface restoration. Two surface restorations were needed by 77(22%) 12 year old children and 144(48%) 15 year old children needed two surface restorations. 27 (7.7%) 12 year old children and 22(7.3%) 15 year old children needed pulp care and 17(4.9%) 12 year old children and 12(4%) 15 year old children needed extraction.

Table 18: Distribution of study population based on Treatment needs

	Private school		Government school		Total
	12 years	15 years	12 years	15 years	
One surface restoration					
Yes	129(71.3%)	88(59.1%)	112(66.3%)	125(82.8%)	454(69.9%)
No	52(28.7%)	61(40.9%)	57(33.7%)	26(17.2%)	196(30.1%)
Two surface restoration					
Yes	42(23.2%)	81(54.4%)	35(20.7%)	63(41.7%)	221(34%)
No	139(76.8%)	68(45.6%)	134(79.3%)	88(58.3%)	429(66%)
Pulp care					
Yes	11(6.1%)	16(10.7%)	16(9.5%)	6(4%)	49(7.5%)
No	170(93.9%)	133(89.3%)	153(90.5%)	145(96%)	601(92.6%)
Extraction					
Yes	5(2.8%)	6(4%)	12(7.1%)	6(4%)	29(4.4%)
No	176(97.2%)	143(96%)	157(92.9%)	145(96%)	621(95.6%)

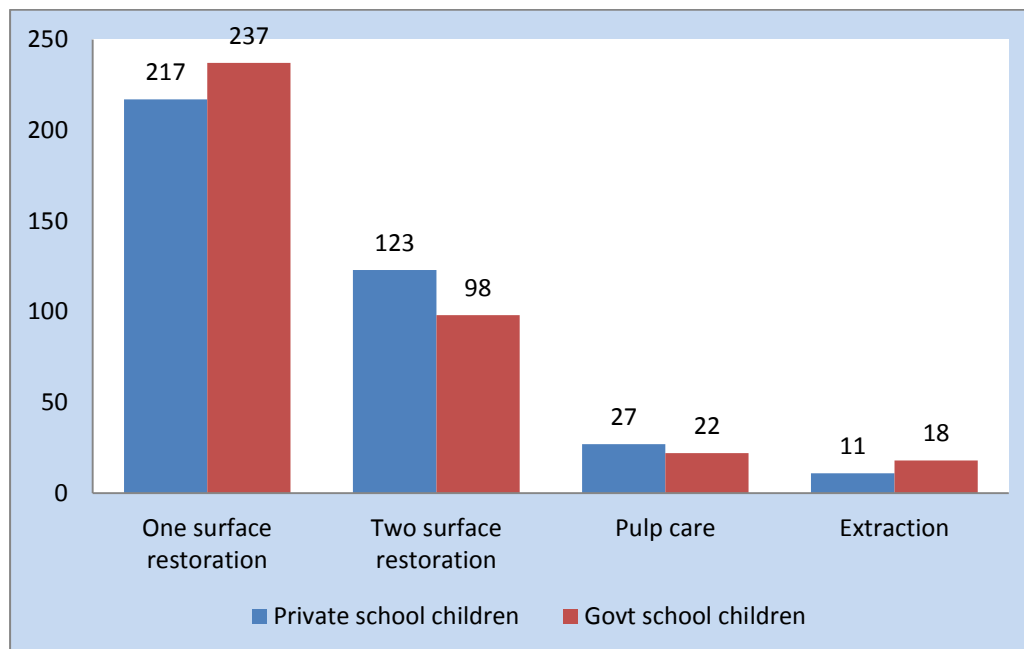
Graph 17: Distribution of study population based on Treatment needs

Table 19, Graph 18 shows the mean DMFT of the study population. 12 year old children and 15 year old children had a mean DMFT Value of 2.14 and 2.72 respectively.

Statistical test showed significant difference between Mean DMFT and Age.

Table 19: Distribution of study population based on Mean DMFT

DMFT	Private school		Government school	
	12 years	15 years	12 years	15 years
MEAN(S.D)	2.01(1.63)	2.28(1.9)	2.27(1.93)	3.15(2.24)
MEDIAN	2	2	2	2
MEAN RANK	294.28	313.98	315.20	285.97
P VALUE	< 0.001 (Highly significant); Kruskal Wallis ANOVA			

(Mann Whitney U Value = 44903; P = 0.001)

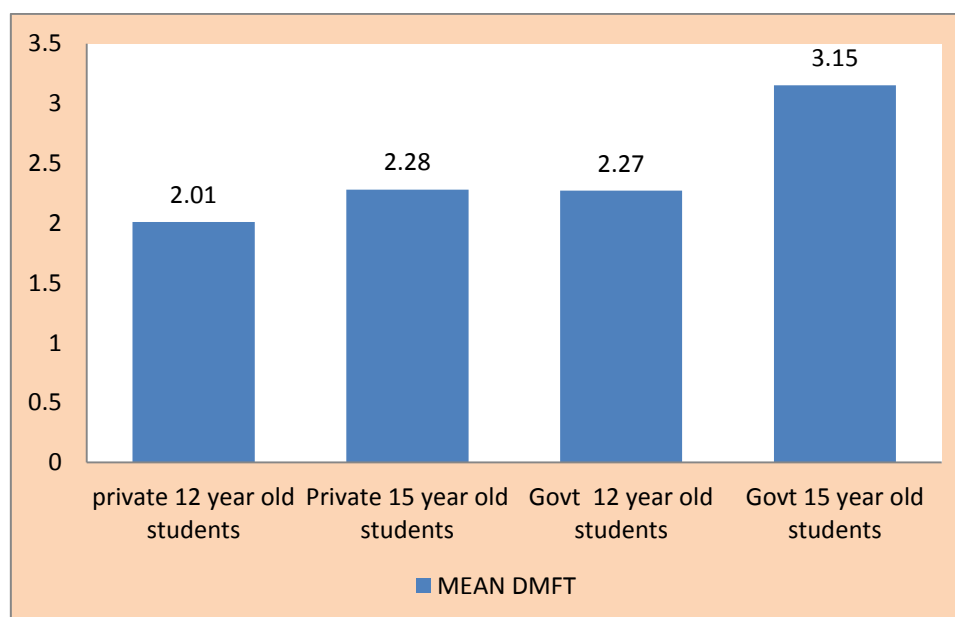
Graph 18: Distribution of study population based on Mean DMFT

Table 20, Graph 19(a) and (b) shows the distribution of study population based on Prosthetic needs. Among the study population, 29(4.4%) children need upper one unit prosthesis, 11(1.6%) children need upper multiunit prosthesis and 6(0.9%) children need both upper one unit and multiunit prosthesis. 63(9.6%) children need lower one unit prosthesis, 22(3.3%) children need lower multiunit prosthesis and 12(1.8%) children need both lower one unit and multiunit prosthesis.

Statistical test showed that there is significant difference with respect to both upper and lower prosthetic treatment needs between 12 and 15 year old students studying in private and Government schools.

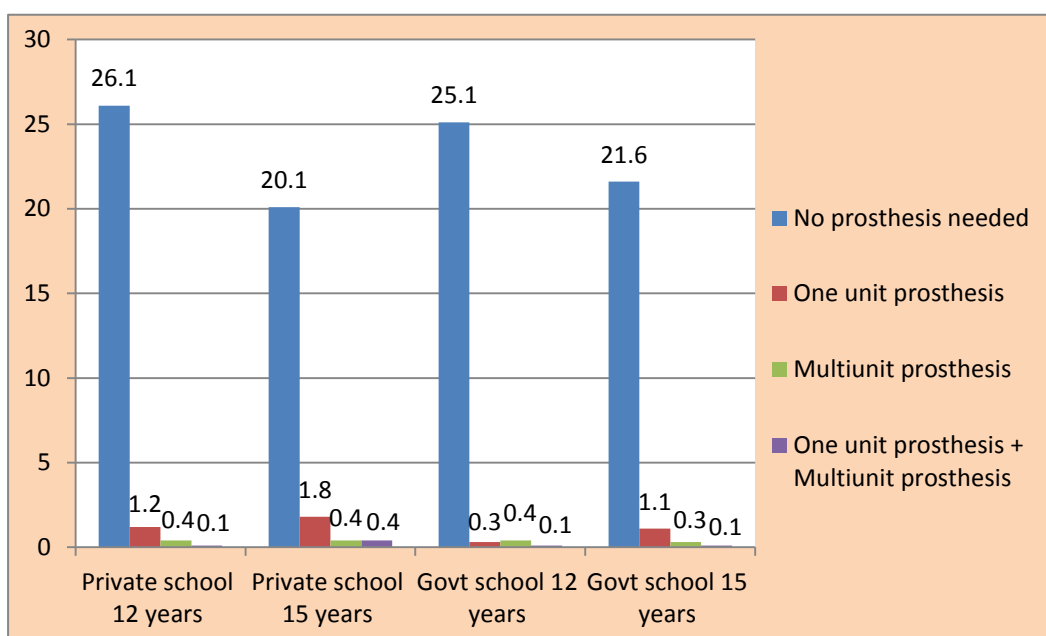
Table 20: Distribution of study population based on Prosthetic needs

PROSTHETIC NEEDS	Private school		Government school		Total
	12 years	15 years	12 years	15 years	
UPPER					
No prosthesis needed	169(26%)	131(20.1%)	163(25.1%)	141(21.6%)	604(92.9%)
One unit prosthesis	8(1.2%)	12(1.8%)	2(0.3%)	7(1.1%)	29(4.4%)
Multiunit prosthesis	3(0.4%)	3(0.4%)	3(0.4%)	2(0.3%)	11(1.6%)
One unit prosthesis + Multiunit prosthesis	1(0.1%)	3(0.4%)	1(0.1%)	1(0.1%)	6(0.9%)
Total	181(27.8%)	149(22.9%)	169(26%)	151(23.2%)	650(100%)
Upper: $\{\chi^2 = 23.33; P < 0.005 \text{ (Significant)}\}$					

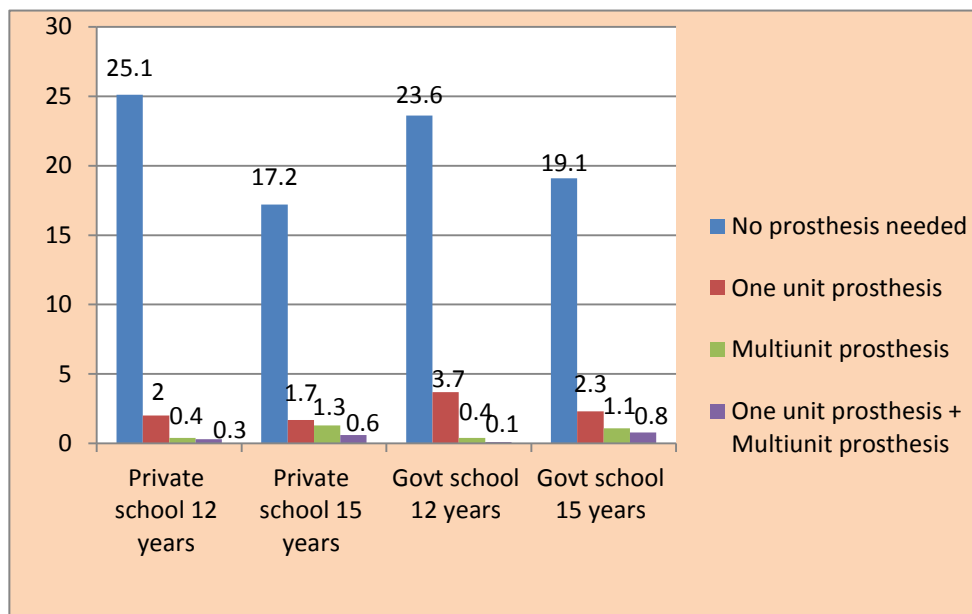
LOWER					
No prosthesis needed	163(25.1%)	112(17.2%)	154(23.6%)	124(19.1%)	553(85.1%)
One unit prosthesis	13(2%)	24(3.7%)	11(1.7%)	15(2.3%)	63(9.6%)
Multiunit prosthesis	3(0.4%)	9(1.3%)	3(0.4%)	7(1.1%)	22(3.3%)
One unit prosthesis + Multiunit prosthesis	2(0.3%)	4(0.6%)	1(0.1%)	5(0.8%)	12(1.8%)
Total	181(27.8%)	149(22.9)	169(26%)	151(23.2%)	650(100%)

Lower: { $\chi^2 = 37.97$; $P < 0.001$ (Significant) }

Graph 19(a): Distribution of study population based on upper Prosthetic treatment needs

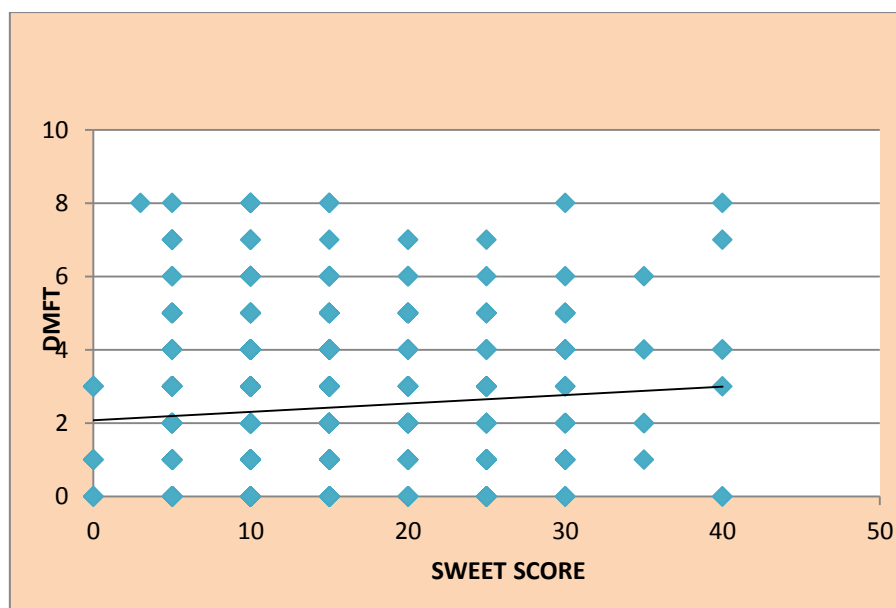


Graph 19(b): Distribution of study population based on Lower Prosthetic treatment needs



Graph 20: Distribution of study population based on correlation with sweet score and DMFT

Statistical test showed a significant correlation between sweet score and Dental caries. ($r = 0.061$; $P = 0.03$).



Graph 21: Distribution of study population based on correlation with Fish intake and DMFT

Statistical test showed significant correlation between frequency of Fish intake and DMFT. ($r = -0.64$; $P = 0.02$).

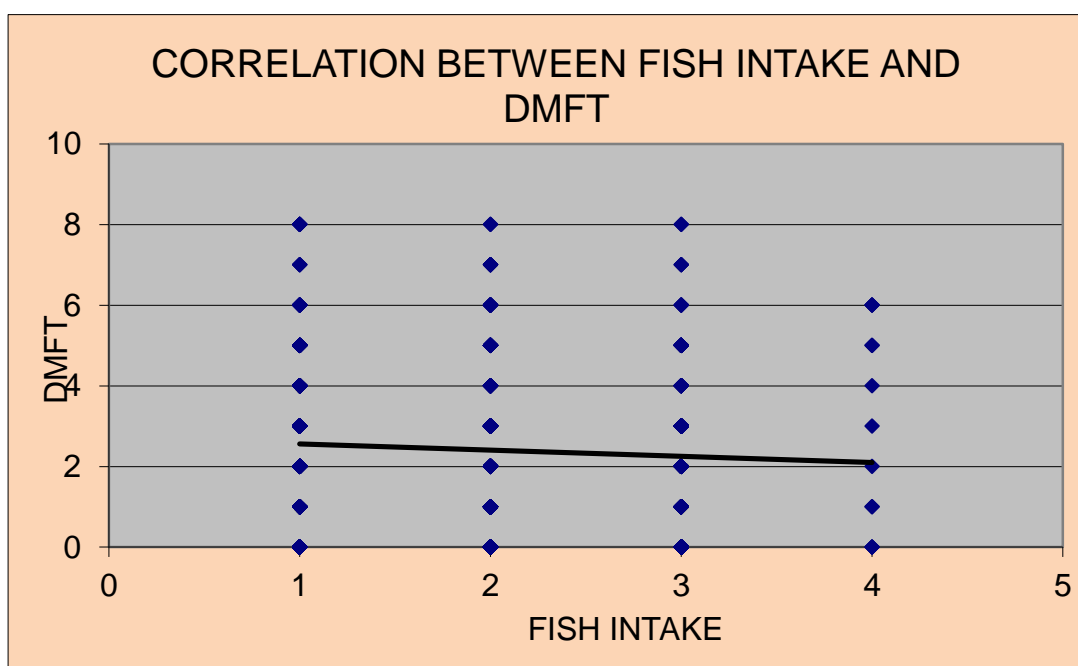


Table 21, Graph 22 shows distribution of study population based on Dental Aesthetic Index (DAI). Majority 429(66%) of the children had Minor malocclusion and needed no or slight treatment. 160(24.6%) had definite malocclusion and needed elective treatment. 61(9.4%) had severe malocclusion and treatment is highly desirable.

Statistical test shows significant difference with respect to Malocclusion between 12 and 15 year old students studying in private and Government schools.

Table 21: Distribution of study population based on Dental Aesthetic Index

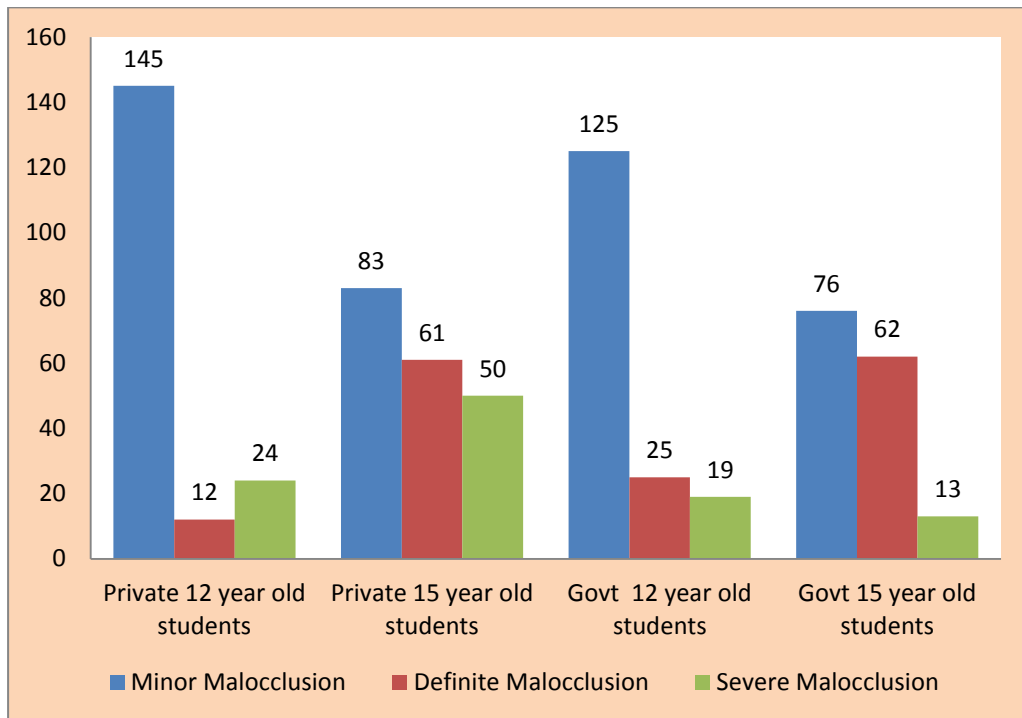
DAI Score	Private school*		Government school*		Total
	12 years [#]	15 years [#]	12 years [#]	15 years [#]	
Minor malocclusion	145(22.3%)	83(12.8%)	125(19.2%)	76(11.7%)	429(66%)
Definite malocclusion	12(1.8%)	61(9.4%)	25(3.8%)	62(9.5%)	160(24.6%)
Severe malocclusion	24(3.7%)	5(0.8%)	19(2.9%)	13(2%)	61(9.4%)
Chi square =87.60; P< 0.001(Highly significant).					

{[#] $\chi^2 = 87.60$; P < 0.001(Highly significant)}

{* $\chi^2 = 106.488$; P = 0.000(Highly significant)}

Graph 22: Distribution of study population based on Dental

Aesthetic Index



DISCUSSION

Oral health is an essential component of general health. Horowitz (2003), a pioneer in the field of dental health education, felt that there is an association between oral cavity and the development of healthy personality, perceptions and the overall experiences of pleasure by the child. Particularly in children, untreated oral diseases frequently lead to serious general health problems, significant pain, interference with daily function, and even learning disabilities.³⁶

Among Children, those belonging to fishing community deserve special attention due to myriad reasons. Long sea voyages force the fishermen to work for prolonged hours. Owing to their stressful work in the night, they would rest in day hours and hence may not spare time to take care of their health as well as their children's health.¹⁶ Another important factor that influences oral health is the diet of fishermen community. Lack of fruits and vegetables and increased frequency of fish intake make this population vulnerable to dental diseases. Moreover, their access to dental services is also very limited. In India, only few studies have been conducted to assess the oral health status of children belonging to Fishermen community. Hence, the present study was contemplated to assess the oral health status and treatment needs of 12 and 15 years old school going children of fishermen community residing at East Coast Road, Chennai.

The present study was conducted among 650(344 males and 306 females) school going children of fishermen community residing at East Coast Road, Chennai. In this study the WHO Oral Health Assessment Proforma (Basic Oral Health Survey methods, 1997)³⁷ was used to assess the oral health status and treatment needs of the study population. A closed-ended questionnaire was administered to collect data pertaining to perceived dental health and utilization of dental services, oral hygiene practices and Diet pattern including amount of fish intake and source of drinking water.

The present study included 330 private school students and 320 government school students. It is difficult to collect data on socioeconomic factors from children, as they may not be aware of their parent's income. So to get an insight into their socioeconomic status, the study population was classified into those belonging to private and government schools. It may be perceived that children belonging to lower socioeconomic status might study in Government schools rather than in a Private school. The study population consists of 350 children of age 12 years and 300 children of age 15 years. Children belonging to these two age groups were included as 12 years is the global monitoring age for caries, while 15 years is the index age for assessment of periodontal disease indicators.

ORAL HYGIENE PRACTICES

In this present study, 470 children (72.3%) were brushing once a day which included 257(73.4%) students of 12 years age group and 213(71%)

students of age 15 years. Only 180(27.7%) were brushing twice or more a day which includes 93(26.6%) students among 12 years and 87(29%) students among 15 years, which is less compared to Stalin A et al(2011)³² study among 11 to 14 years children in Tiruchengode, Tamil Nadu.

In the present study, 617(94.9%) were using Tooth brush and tooth paste and 33(5.1%) were using Finger and tooth powder. However, at the same time a high prevalence of calculus and Dental caries were observed in the clinical investigation. This inconsistency could be explained by either over reporting of tooth brushing frequency or simply reflecting a lack of tooth brushing skills. While the tooth brushing technique may be improper to majority of children, they may still gain some caries preventive effect when using tooth paste with appropriate level of fluoride.

DENTAL VISITS AMONG STUDY POPULATION

In this present study, among the total study population 323 children (49.7%) had tooth ache or discomfort in their teeth, of which 156 (44.6%) were 12 years children and 167 (55.7%) were 15 years children. Among this only 226(34.8%) of the total study population have visited dentist during past 12 months. However there was no much difference among 12 years 118 (33.7%) and 15 years 108(36%) in visiting dentist during past 12 months. 63 children from 12 years and 70 children from 15 years had visited dentist for Tooth ache. Dental visits are mostly sought for symptomatic reasons and

restoration is often the service rendered for pain relief. In our study also, most of the children never visited the dentist because parents and children did not recognize the need for regular dental check-up and many children cannot afford to undergo dental treatment as most of them may think it as an expensive procedure.

PERIODONTAL DISEASE

Among this study population based on CPI index, majority of the study population 623(95.8%) had CPI score of 2(i.e., calculus), while only 27(4.1%) of the study population had CPI score of 0(i.e., healthy gums). This finding is similar to 93.1%periodontal disease prevalence in the fisherman study conducted by Saravanan et al (2011)¹⁴ in Tirunelveli district, Tamil Nadu. This may be due to socioeconomic factors and the availability, affordability and awareness towards oral hygiene, lack of proper technique of brushing and lack of access to dental care.

This finding is higher in relation to CPI score of 2 (i.e., calculus) and low in compared to CPI score of 0 (i.e. healthy gums) when compared to Kumari et al (2011)²⁰ in Lucknow.

MEAN DMFT

In this population study, 12 year old children and 15 year old children had a mean DMFT of 2.14 and 2.72 respectively. This finding is similar to the

study done by Dhaval et al (2011)²⁴ study among school going 12 and 15 years children in Ahmedabad city.

The study finding is lower when compared Saravanan et al (2011)¹⁴ study among fishermen in Tirunelveli district, Tamil Nadu where the mean DMFT was 3.61.

The study finding is higher than the study done by Bhat et al (2007)¹⁷ where the Mean DMFT was 1.89 conducted in fisher folk communities in coastal areas of Karnataka among 10-14 years children, Bhat et al (2008) study conducted in Harikantra fishing community in Karnataka and Anu et al (2011) study conducted among 12 to 13 years school children in Chennai.

The study finding comparatively very high than the study conducted by Ganesh A et al (2011)³⁴ among 12 and 15 years children in Chennai and Mehta. A et al (2011)²² study among 4 to 17 years children in various government and private schools in Chandigarh , Grover S et al (2011)²⁸ among school going children. This may be due to higher sweet consumption (54%), increased intake of fish (71.5%). Diet, availability of sticky carbohydrate rich food, presence of certain trace elements like selenium, relative humidity might have influenced the occurrence of Dental caries in this study population.

Implementation of oral health program at early age helps in improving preventive dental behaviour and attitudes, which is beneficial throughout the

life time. This can be achieved by educating the parents about dental health through school dental programme.

CARIES PREVALANCE

In this study population, 78.6% had caries prevalence of which 76% were 12 years and 82% were 15 years.

This is comparatively similar to Bhat et al (2007)¹⁷ study conducted in fisher folks communities in coastal areas of Karnataka where 80.64% had decayed teeth.

This reading is relatively higher compared to 63.8% dental caries in Bhat et al (2008)²¹ study in Harikantra rural fishing community in Karnataka, 49.9% decayed teeth in the study conducted by Mehta. A et al (2011)²² among various government and private school children in Chandigarh, 54.9% caries prevalence in Saravanan et al (2011)¹⁴ among fishermen in Tirunelveli district, TamilNadu, 64.98% caries prevalence in Amith et al (2011)²⁶ in 12 and 15 years school children in Waranagar, Maharashtra, 50.34% decayed teeth in Sujatha et al (2011)³³ study among 7 to 12 years and 13 to 16 years group in both urban and rural areas in Guntur district, 40.2% for 12 years and 51% for 15 years in the study conducted by Ganesh et al (2011)³⁴ in Chennai, 57.7% for 12 years and 48.5% for 15 years in the study conducted by Grover S et al (2011)²⁸ in the school going children.

The higher prevalence may be the results of poor dietary habits including high consumption of sugar containing products combined with frequency of tooth brushing and frequency of dental visits. So, need for promotion of oral health and provision of availability of treatment to every child as well as planned school based oral health education program were needed to increase the oral health knowledge among these school children.

SWEET SCORE AND CARIES PREVALANCE

In this study population, among the 12 year old school children, 53 (15.1 %) had excellent sweet score, 97 (27.7 %) had good sweet score and 200 (57.7 %) were in watch-out zone. Among the 15 year old school children, 55 (18.3 %) had excellent sweet score, 94 (31.3 %) had good sweet score and 151 (50.3 %) were in watch-out zone.

This finding is similar to Ganesh et al (2011)³⁴ study among 12 and 15 years children in Chennai where 16.9% had excellent sweet score, 20.6% had good sweet score, 62.6% were in watch- out zone and also similar to Anu et al (2011)²⁵ study among 12 to 13 years school children in Chennai. Results revealed that among 138 urban population, 6.5% had excellent sweet score, 25.36% had good sweet score and 68.11% were in watch-out zone. Among 179 rural populations, 18.40% had excellent sweet score, 14.25% had good sweet score and 67.03% were in watch-out zone. This may be due to rapid influx of cariogenic foods in their locality and easy availability of these

products from street vendors and shops located around all the schools which resulted in more consumption of these attractive sticky sugary stuffs.

Since, majority of school children were in watch-out zone, early interventions like dietary counselling among school children can be appropriate to inhibit the carious process.

FISH INTAKE AND CARIES PREVALANCE

In this study population, among the 12 years old children, 115 (32.9 %) were taking fish daily, 120 (34.3%) were taking fish more than 3 days in a week, 109 (31.1 %) were taking fish less than 3 days in a week and 5(1.4 %) never took fish. Among the 15 years old children, 107 b(35.7 %) were taking fish daily, 122 (40.7 %) were taking fish more than 3 days in a week, 64 (21.3 %) were taking fish less than 3 days in a week and 7 (2.3 %) never took fish. The caries prevalence for 12 and 15 years old children is 78.6% and 76%. This finding is similar to 80.64% caries prevalence of Bhat et al (2007)¹⁷ study in fisher folk communities in coastal areas of Karnataka.

Selenium could affect mineralization of enamel would be by altering the uptake of fluoride ion into enamel as Fluor apatite. Fluor apatite may stabilize the crystal lattice and render enamel less soluble to the acid attack of the caries process. The lack of interaction between fluoride and selenium in bones and teeth could also be due to the large disparity in their concentrations, since fluoride concentrations can be from fifty to several thousand times larger than

the selenium concentrations in the hard tissues. The fact that dietary organic and inorganic selenium compounds did not influence fluoride metabolism in the hard tissues has important implications regarding how selenium may increase dental caries.^{38,39}

Since the present study being of cross sectional design, the exact temporality between fish intake and Dental caries could not be determined. Further, longitudinal study should be conducted to find the exact causal relation between fish intake and dental caries.

TREATMENT NEEDS

Majority of the study population 454(241(68.8%) 12 year old children and 213(71%) 15 year old children need one surface restoration. Two surface restorations were needed by 77(22%) 12 year old children and 144(48%) 15 year old children needed two surface restorations. 27(7.7%) 12 year old children and 22(7.3%) 15 year old children needed pulp care and 17(4.9%) 12 year old children and 12(4%) 15 year old children needed extraction.

The study finding is similar to Ganesh et al (2011)³⁴ study conducted among 12 and 15 years in Chennai in relation to 4.1% extraction and higher for one surface restoration (44.4%), two surface restoration (15.5%), and pulp care (2.9%).

The study finding is relatively lower compared to adult fishermen study conducted by Saravanan et al (2011)¹⁴ in Tirunelveli district. Tamil

Nadu in which the treatment needed for extraction (39.6%), filling (20.8%), and root canal treatment(11.8%).

Hazardous occupations, unscheduled working hours, job related stress, pernicious habits, irregular diet due to lack of availability of home cooked food, lower awareness levels and socio-economic status seemed to influence the oral health status of fishermen population.

MALOCCLUSION AND DAI SCORE

In this study population, majority 448(68.9%) of the children had minor malocclusion and needed no or slight treatment. 172(26.5%) children (49(14%) 12 year old children and 123(41%) 15 year old children) had definite malocclusion and needed elective treatment. 30(4.6%) children (12(3.4%) 12 year old children and 18(6%) 15 year old children) had severe malocclusion and treatment is highly desirable. This may be due to pernicious habits during childhood, premature exfoliation of deciduous teeth. Tooth mortality in early childhood has a direct influence on future development and establishment of occlusion.

The study finding is high when compared to Pankaj S et al (2010)²⁹ study conducted among 12 to 15 years children in Belgaum, Karnataka where 88.6% had a dental appearance (exhibited lower DAI score) which require no orthodontic treatment and higher(26.5%) when compared to 11.4% of children requiring orthodontic treatment.

Reddy et al (2011)¹⁸ conducted a study to assess the prevalence of malocclusion and orthodontic treatment needs among 300 school children of 12-15 years old of Maduravoyal area, Chennai. This study showed 110(36.7%) had definite malocclusion requiring elective treatment, 83(27.7%) had severe malocclusion requiring highly desirable treatment. These findings are relatively higher than this present study.

SUMMARY

The present descriptive cross-sectional study was conducted to assess the oral health status and treatment needs of 12 to 15 years old school going children of Fishermen community residing at East coast road, Chennai, Tamil Nadu. Ethical clearance was obtained from the Institution Review Board of Ragas Dental College & Hospital and Chief Educational Officer, Kancheepuram District to conduct the study. (**ANNEXURE I & II**)

Children, whose parents involved in fishing as primary occupation obtained with the help of school records and who were present on the day of examination were included in the study. Data was collected using proforma which consisted of WHO basic oral health assessment form (1997) and a pre-tested, closed ended questionnaire. The collected data was subjected to statistical analysis using SPSS 15 version.

The findings of the current study were as follows:

- Of the 650 School children examined, 350 children were 12 years old and 300 children were 15 years old.
- Majority of the children, 419 (64.5%) were satisfied on appearance of their teeth.
- Majority of the children, 617 (94.9%) used tooth paste and tooth brush to clean their teeth.

- Majority of the children, 470 (72.3%) brush their teeth once a day.
- Mean DMFT Value of 12 year old private and Government school children were 2.01 and 2.27 respectively. While Mean DMFT value of 15 year old private and Government school children were 2.28 and 3.15 respectively.
- A large percentage of the children, 424 (65.2%) had not visited dentist before. Of those visited, 133 (58.8%) children had visited dentist for Tooth ache.
- Majority of the children, 351 (54%) were in Watch-out zone during sweet score calculation with significant relation to DMFT.
- Majority of the children, 464 (71.3%) were taking fish more than 3 days in a week with significant relation to DMFT.
- On TMJ examination, 647 (99.6%) had no TMJ symptoms and 3 (0.4%) children had clicking.
- 43 (6.6%) children had demarcated enamel opacities.
- 16 (2.5%) had questionable dental fluorosis, and 2 (0.3%) children had mild dental fluorosis.
- 623 (95.8%) had CPI score of 2(ie., calculus), while only 27 (4.1%) of the study population had CPI score of 0(ie., healthy gums).
- 511 (78.6%) children had decayed crown, 127 (19.5%) had teeth missing due to caries, 56 (8.6%) had filled crown and 4 (0.6%) children had decayed root.

- 454(69.8%) children needed one surface restoration, 221(34%) needed two surface restoration, 49 (7.5%) needed pulp care and 29(4.4%) needed extraction.
- 172(26.5%) children had definite malocclusion and needed elective treatment. 30(4.6%) children had severe malocclusion and treatment is highly desirable.

CONCLUSION

The magnitude of the dental diseases was high among these children. Oral health status of fishermen children was relatively poor with high caries prevalence and poor periodontal health.

Poor socioeconomic status, Lack of formal education among parents, Diet, availability of sticky carbohydrate rich food, presence of certain trace elements like selenium, relative humidity might have influenced the occurrence of dental caries in this study population. As oral health is an integral part of general health, the oral health of these children may also get influenced by such environmental and socioeconomic factors. Majority of the study population required oral prophylaxis and restoration of their teeth.

Among the oral diseases, Dental caries and periodontal diseases have historically been considered the most important global oral health burdens. Despite various steps taken to improve the oral health of people, oral health problems still remain as a burden in many communities, particularly among underprivileged people.

The present study was conducted to assess the oral health status and treatment needs of 12 and 15 years old school going children of Fishermen community residing at East Coast Road, Chennai revealed that the oral health status of these children was poor with high caries prevalence and high Malocclusion. This study also highlighted the contribution of high intake of sweets and Fish and its adverse effects on oral health conditions of these children.

RECOMMENDATIONS

Oral health education should be given to the fishermen population about the oral health problems through pamphlets issued by Social welfare organization of fishermen population and fishermen cooperative societies and also giving advice on oral hygiene and the importance of regular dental check-up.

1. Fishermen cooperative societies may establish a dental clinic within their area to deliver comprehensive health care to fishermen population.
2. Nearby Dental colleges and IDA if any may adopt Fishermen community which may help to reduce the unmet back log of dental treatment needs of these children who are poor socio economically.
3. Voluntary organizations can organize free medical and dental camps periodically so that the children can get free treatment.
4. Centrally Sponsored National Scheme on Welfare of Fishermen, Chief Minister's Comprehensive Health Insurance Scheme should be used by fishermen to cater their oral needs.
5. The fishery departments should ensure health insurance for all dental procedures and distribution of Tooth pastes, mouth washes at a subsidized rate for Fishermen population.

BIBLIOGRAPHY

1. Park K. Text Book of Preventive and Social Medicine.20th Edition.Jabalpur. Banarsidas Bhanot 2009.
2. Ustun.AP, Corvalan.C. Preventing Disease Through Healthy Environments. Publication of World Health Organisation, 2006. WHO press.
3. Blinkhom AS. Dental Health education: What Lessons Have We Ignored Br dent J 1998; 184(2): 58-59.
4. National oral health survey and fluoride mapping 2002-2003. Dental Council of India.
5. Rang WS, Bian JY. Wang WJ. Effectiveness of An Oral Health Education And Caries Prevention Program In Kindergartens In China. Community Dent Oral Epidemiol 2003; 31: 412-6.
6. Petersen PE, Peng G, Tai B. Effect Of A School-Based Oral Health Education Programme in Wuhan City, Peoples Republic of China. *Int. Dent. J. 2004: 54: 33-41.*
7. Harris NO. School Based Dental Health Programs Primary Preventive Dentistry. Harris and christen AG. 3rd edition. 2004, Pearson Prentice Hall Publication.
8. Thomas S, Tandon S, Nair S. Effect of Dental Health Education on The Oral Health Status of a Rural Child Population by involving target group. J. Indian SocPedoPrev Dent. 2000; 18(3): 115-125.

9. http://en.wikipedia.org/wiki/Fishing_in_India accessed on 25.4.2012.
10. http://en.wikipedia.org/wiki/Ports_in_India accessed on 27.4.2012.
11. Carel RS, Carmil D, Keinan G. Occupational stress and well-being: do seafarers harbor more health problems than people on the shore? *Isr J Med Sci* 1990; 26(11):619-24.
12. Casson FF, Zuccherro A. Work and chronic health effects among fishermen in Chioggia, Italy. *G Ital Med LavErgon* 1998; 20(2): 68-74.
13. Lawrie T, Matheson C. The health and lifestyle of Scottish fishermen: a need for health promotion. *Health Educ Res* 2004; 19(4):373-79.
14. Saravanan N, Reddy C.V.K, Veeresh D.J. A Study to assess the Oral health status and treatment needs of Fishermen population in coastal region of Tamilnadu. *JIAPHD* 2011; 18: 266-77.
15. Saarni U, Saarni H. Xylitol for messrooms--A method worth trying to prevent caries among seafarers. *Bull InstMarit Trop Med Gydnia* 1997; 48:91-7.
16. Sandbeek OW. Dental health status and use of dental services among seamen in overseas trade. *Nor TannlaegeforenTid* 1977; 87(6):275-81.
17. Megashyam B, Nagesh L, Ankola A. Dental caries status and treatment needs of children of fisher folk communities, residing in the coastal areas of Karnataka region, South India. *West Indian Med J* 2007; 56(1): 96-8.
18. Reddy V.C, Priya S.H, Chaly P.E, Ingle N.A. Prevalance of Malocclusion and orthodontic treatment needs among 12-15 years old school children of Maduravoyal area, Chennai. *JIAPHD* 2011; 18: 591-97.

19. Shivakumar V, Gopinath V, Saravanakumar R. A cross sectional study on the prevalence and determinants of Dental caries among school children of Padur. *JIAPHD* 2011; 18: 1138-43.
20. Kumari M, Saha S, Jaganath G.V. Periodontal status of 12-15 years old urban and rural school children of Lucknow. *JIAPHD* 2011; 18: 171-76.
21. Bhat M. Oral health status and treatment needs of a rural Indian fishing community. *West Indian Medical Journal* 2008; 57(4): 415-418.
22. Mehta A, Gupta J, Bhalla S. Prevalance of dental caries among 3-17 year old children studying in various government and private schools at Chandigarh. *JIAPHD* 2011; 18: 89-93.
23. Kaur N, Hiremath S.S. Prevalance of Traumatic injuries to permanent anterior teeth among 8-15 years old Government and private school children in Bangalore city. *JIAPHD* 2011; 17(1): 357-63.
24. Dhaval P.R, Sujal P.M. Assessment of Gingival and Dental caries status among 12 and 15 years old school going children of Ahmedabad city. *JIAPHD* 2011; 18(3): 967-71.
25. Anu V, Shivakumar M, Madankumar P.D. Sweet score and Dental caries experience of 12-13 year old school children in Chennai. *JIAPHD* 2011; 17(1): 305-8.
26. Amith H.V, D'Cruz A.M. Prevalance of Dental caries amongst 12-15 years old school going children in Warananagar, Kolhapur, Maharashtra. *JIAPHD* 2011; 18(2): 887-90.

27. Naveen kumar B, Ramesh N, Reddy V. Prevalance of Traumatic dental injuries to permanent incisors among 12 years old school children in Tandoor, Andhra Pradesh. *JIAPHD* 2011; 17(2): 704-7.
28. Grover S, Anuradha P. Prevalance and treatment needs of dental caries among 12 and 15 years old school going children in Lucknow city. *JIAPHD* 2011; 18: 105-11.
29. Pankaj S. Prevalance of malocclusion and orthodontic treatment needs among 12-15 years school children using dental aesthetic index. *JIAPHD* 2010; 15: 81-84.
30. Senthilkumar M, Balagopal S, Reddy S. Caries prevalence among 5-12 years school children residing in rural Chennai. *JIAPHD* 2011; 18(3): 1040-43.
31. Bhat P.K, Aruna C.N. Dietary habits, Oral hygiene practices and prevalence of Dental caries among 10-12 years old school children of South Bangalore. *JIAPHD* 2011; 17: 78-82.
32. Stalin A, John J.B, Preethi V. Diet pattern and caries prevalence of Children aged 11-14 years in Tiruchengode. *JIAPHD* 2011; 17(1): 554-59.
33. Sujatha B, Saisankar A.J, Manojkumar M.G. Prevalance of dental caries and treatment needs for school going children in rural and urban areas of Guntur district. *JIAPHD* 2011; 17(2): 533-38.

34. Ganesh A, Ingle N, Chaly P, Reddy C. Sugar consumption and Dental caries experience in 12 and 15 year old children in Chennai. *JIAPHD* 2011; 18(1):462-73.
35. Mahesh kumar P, Joseph T, Varma R.B, Jayanthi M. Oral health status of 5 years and 12 years school going children in Chennai city- An epidemiological study. *Journal of Indian Society of Pedodontics and Preventive dentistry* 2005; 23(1):17-22.
36. Horowitz AR. Initial Impact of a National Dental Education Program on the Oral Health and Dental Knowledge of Children. *The Journal of Contemporary Dental Practice*, 2003;4(2):1-7.
37. WHO oral health surveys basic methods, 4th Ed. 1999. AITBS Pub.
38. Thomas R. Shearer. Fluoride-Selenium Interaction in the Hard and Soft Tissues of the Rat. *Journal of Nutrition* 1976;106: 451-456.
39. Hadjimarkos, D. M. Selenium in relation to dental caries. *Food Cosmet. Toxicol* 1973;11: 1083-1095.

ANNEXURE I



RAGAS DENTAL COLLEGE & HOSPITAL

(Unit of Ragas Educational Society)

Recognized by the Dental Council of India, New Delhi

Affiliated to The Tamilnadu Dr. M.G.R. Medical University, Chennai

2/102, East Coast Road, Uthandi, Chennai - 600 119. INDIA.

Tele : (044) 24530002, 24530003 - 06. Principal (Dir) 24530001 Fax : (044) 24530009

To:

The Chief Educational Officer
Kancheepuram District

Sir / Madam,

This is to certify that Dr. Raj Mohan. M is a bonafide Second year MDS (Public Health Dentistry) student of this college. He is doing the dissertation on "An Assessment of Oral Health Status and Treatment Needs of 5, 12 and 15 years old school going children of fishermen community residing at East Coast Road, Chennai". I will be thankful if you could allow him to collect data's from the school authorities to proceed with his dissertation.

Thanking you,

Yours sincerely,

(Dr. S. RAMACHANDRAN)

PRINCIPAL

PRINCIPAL

RAGAS DENTAL COLLEGE & HOSPITAL
CHENNAI

Date: 19.12.2011

ANNEXURE II

PERMISSION LETTER OBTAINED FROM THE CHIEF EDUCATIONAL OFFICER, KANCHIPURAM DIST., TAMIL NADU

P.Selvakumari
CEO
Kancheepuram Dist

Proceedings of the chief educational officer, Kancheepuram Dist

Pdl 1/12

Dated:21.1.2012

Sub:- Education – Permission to attend the project works at schools

Ref:- Application Dated 18.1.2012 of the individual concerned

Dr.M.Rajmohan, Post graduate student, Ragas dental college, Chennai
permitted to do his project work in the schools enclosed in the list

Encl:- List of Schools

முதலமைச்சர் அலுவலகம்
CHIEF EDUCATION OFFICER
KANCHEEPURAM DIST

To,

Concerned Headmaster

Copy to District Elementary Education Officer, Kancheepuram Dist

ANNEXURE III - QUESTIONNAIRE

AN ASSESSMENT OF ORAL HEALTH STATUS AND TREATMENT
NEEDS OF 12 TO 15 YEARS OLD SCHOOL GOING CHILDREN OF
FISHERMEN COMMUNITY RESIDING AT EAST COAST ROAD,
CHENNAI.

QUESTIONNAIRE- 12 & 15 years

Name of the school / பள்ளியின் பெயர் :

Private/ Government school / தனியார் / அரசு பள்ளி :

Name of the student / மாணவரின் பெயர் :

Sex / பாலினம் :

Age / வயது :

Fathers occupation / தந்தையின் தொழில் :

Mothers occupation/ தாயின் தொழில் :

1. Are you satisfied with the appearance of your teeth?
உங்கள் பற்களின் தோற்றம் உங்களுக்கு திருப்தியாக உள்ளதா?

Yes / ஆம்

No / இல்லை

2. Did you have tooth ache or felt discomfort on account of your teeth during the past 12 months ?
கடந்த 12 மாதங்களில் உங்களுக்கு பல் வலி அல்லது பல்லினால் அசௌகரியம் இருந்ததா?

Yes / ஆம்

No / இல்லை

3. Have you visited the dentist during last 12 months?
கடந்த 12 மாதங்களில் நீங்கள் பல் மருத்துவரிடம் சென்றீர்களா?

Yes / ஆம்

No / இல்லை

if yes, what was the reason for your last visit to the dentist?

ஆம் எனில், எந்த காரணத்திற்காக கடைசியாக பல் மருத்துவரிடம் சென்றீர்கள்.

Pain / வலி

if others, specify..... / மற்ற காரணம் எனில் குறிப்பிடுக.

4. Do you have the habit of brushing your teeth?
பல் துலக்கும் பழக்கம் உள்ளதா?

Yes / ஆம்

No / இல்லை

5. How often do you brush your teeth?
எத்தனை முறை பல் துலக்குவீர்கள்?

Once a day / ஒரு நாளைக்கு ஒரு முறை

Two or more times a day / ஒரு நாளைக்கு இரண்டு முறை அதற்கு மேலாக

Once a week / வாரம் ஒரு முறை

Never / பல் துலக்குவது இல்லை

6. Do you use any of the following to clean your teeth(tick any one)
நீங்கள் கீழ்க்காணும் ஏதாவது ஒன்றை பல் துலக்க உபயோகிக்கிறீர்களா?
(ஒன்றை ✓ செய்க)

Tooth brush & tooth paste / டூத் பிரஷ் மற்றும் டூத் பேஸ்ட்

Finger and tooth powder / விரல் மற்றும் பற்பொடி

Charcoal / Brick Powder / கரி / செங்கல் பொடி

Chew stick / வேப்பங்குச்சி

Other / மற்றவை

7. How often you take any of the following yesterday?
கீழே குறிப்பிட்டுள்ளவைகளை நேற்று எத்தனை முறை உட்கொண்டீர்கள்?

Milk / பால் =

Fruit juice/ drinks / பழச்சாறு அல்லது குளிர்்பானங்கள் =

Chocolates/sweets / சாக்லேட் / இனிப்பு வகைகள் =

8. How often do you take fish with your food?
எத்தனை முறை உங்கள் உணவோடு நீங்கள் மீன் சாப்பிடுவீர்கள்?
- a. Daily / தினமும்
 - b. More than three days in a week / வாரத்திற்கு 3 நாட்களுக்கு மேல்
 - c. Less than three days in a week / வாரத்திற்கு 3 நாட்களுக்கு குறைவாக
 - d. Never / எப்பொழுதும் இல்லை
9. Your source of drinking water
நீங்கள் உபயோகிக்கும் குடிநீர்
- a. Packaged drinking water / கேன் தண்ணீர்
 - b. Corporation water / மாநகராட்சி வழங்கும் குடிநீர்
 - c. Bore well water / ஆழ்குழாய் கிணறு தண்ணீர்

ANNEXURE IV – WHO Proforma 1997

WHO ORAL HEALTH ASSESSMENT FORM (1997)

Country		Year		Month		Day		Identification number		Examiner		Original/duplicate	
Leave blank (1)		Year (5)		Month (6)		Day (9)		(11) (14)		(15)		(16)	
GENERAL INFORMATION										OTHER DATA (specify and provide codes)			
Name										_____ (29)			
Date of birth		Year		Month		Occupation		_____ (25)		_____ (30)			
Age in years		(21)		(22)		Geographical location		(26) _____ (27)		CONTRAINDICATION TO EXAMINATION			
Sex (M = 1, F = 2)		_____ (23)		Location type:		1 = Urban _____ (28)		2 = Periurban		Reason: _____ (31)			
Ethnic group		_____ (24)		3 = Rural						0 = No 1 = Yes			
CLINICAL ASSESSMENT													
EXTRA-ORAL EXAMINATION					TEMPOROMANDIBULAR JOINT ASSESSMENT								
0 = Normal extra-oral appearance					SYMPTOMS					SIGNS			
1 = Ulceration, sores, erosions, fissures (head, neck, limbs)					0 = No					0 = No			
2 = Ulceration, sores, erosions, fissures (nose, cheeks, chin)					1 = Yes					1 = Yes			
3 = Ulceration, sores, erosions, fissures (commissures)					9 = Not recorded					9 = Not recorded			
4 = Ulceration, sores, erosions, fissures (Vermilion border)					_____ (33)					Clicking _____ (34)			
5 = Cancrum oris										Tenderness (on palpation) _____ (35)			
6 = Abnormalities of upper and lower lips										Reduced jaw mobility (< 30 mm opening) _____ (36)			
7 = Enlarged lymph nodes (head, neck)													
8 = Other swellings of face and jaws													
9 = Not recorded													

ORAL MUCOSA													
CONDITION					LOCATION								
0 = No abnormal condition					0 = Vermilion border								
1 = Malignant tumour (oral cancer)					1 = Commissures								
2 = Leukoplakia					2 = Lips								
3 = Lichen planus					3 = Sulci								
4 = Ulceration (aphthous, herpetic, traumatic)					4 = Buccal mucosa								
5 = Acute necrotizing gingivitis					5 = Floor of mouth								
6 = Candidiasis					6 = Tongue								
7 = Abscess					7 = Hard and/or soft palate								
8 = Other condition (specify if possible)					8 = Alveolar ridges/gingiva								
9 = Not recorded					9 = Not recorded								
ENAMEL OPACITIES/HYPOPLASIA										DENTAL FLUOROSIS			
Permanent teeth					0 = Normal								
0 = Normal					1 = Questionable					_____ (33)			
1 = Demarcated opacity					2 = Very mild								
2 = Diffuse opacity					3 = Mild								
3 = Hypoplasia					4 = Moderate								
4 = Other defects					5 = Severe								
5 = Demarcated and diffuse opacities					6 = Excluded								
6 = Demarcated opacity and hypoplasia					9 = Not recorded								
7 = Diffuse opacity and hypoplasia													
8 = All three conditions													
9 = Not recorded													
COMMUNITY PERIODONTAL INDEX (CPI)										LOSS OF ATTACHMENT*			
0 = Healthy					0 = 0-3 mm								
1 = Bleeding					1 = 4-5 mm (cementoamel junction (CEJ) within black band)								
2 = Calculus					2 = 6-6 mm (CEJ between upper limit of black band and 8.5-mm ring)								
3* = Pocket 4-5 mm (black band on probe partially visible)					3 = 9-11 mm (CEJ between 8.5-mm and 11.5-mm rings)								
4* = Pocket 6 mm or more (black band on probe not visible)					4 = 12 mm or more (CEJ beyond 11.5-mm ring)								
X = Excluded sextant					X = Excluded sextant								
9 = Not recorded					9 = Not recorded								
* Not recorded under 15 years of age					* Not recorded under 15 years of age								

DENTITION STATUS AND TREATMENT NEED

Identification number

	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28	
Crown (96)																	(81)
Root (82)																	(97)
Treatment (98)																	(113)

	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38	
Crown (114)																	(129)
Root (130)																	(145)
Treatment (146)																	(161)

Primary teeth Crown	Permanent teeth Crown/Root	STATUS	TREATMENT
A	0 0	Sound	0 = None
B	1 1	Decayed	P = Preventive, caries-arresting care
C	2 2	Filled, with decay	F = Fissure sealant
D	3 3	Filled, no decay	1 = One surface filling
E	4 —	Missing, as a result of caries	2 = Two or more surface fillings
—	5 —	Missing, any other reason	3 = Crown for any reason
F	6 —	Fissure sealant	4 = Veneer or laminate
G	7 7	Bridge abutment, special crown or veneer/implant	5 = Pulp care and restoration
—	8 8	Unerrupted tooth, (crown)/unexposed root	6 = Extraction
T	T —	Trauma (fracture)	7 = Need for other care (specify).....
—	9 9	Not recorded	8 = Need for other care (specify).....
			9 = Not recorded

PROSTHETIC STATUS	PROSTHETIC NEED
<p style="text-align: center;">Upper Lower (162) <input type="text"/> <input type="text"/> (163)</p> <p>0 = No prosthesis 1 = Bridge 2 = More than one bridge 3 = Partial denture 4 = Both bridge(s) and partial denture(s) 5 = Full removable denture 9 = Not recorded</p>	<p style="text-align: center;">Upper Lower (164) <input type="text"/> <input type="text"/> (165)</p> <p>0 = No prosthesis needed 1 = Need for one-unit prosthesis 2 = Need for multi-unit prosthesis 3 = Need for a combination of one- and/or multi-unit prostheses 4 = Need for full prosthesis (replacement of all teeth) 9 = Not recorded</p>

DENTOFACIAL ANOMALIES

DENTITION
(166) (167) Missing incisor, canine and premolar teeth—maxillary and mandibular—enter number of teeth

SPACE
(168) Crowding in the incisal segments:
0 = No crowding
1 = One segment crowded
2 = Two segments crowded

(169) Spacing in the incisal segments:
0 = No spacing
1 = One segment spaced
2 = Two segments spaced

(170) Diastema in mm

(171) Largest anterior maxillary irregularity in mm

(172) Largest anterior mandibular irregularity in mm

OCCUSION
(173) Anterior maxillary overjet in mm

(174) Anterior mandibular overjet in mm

(175) Vertical anterior openbite in mm

(176) Antero-posterior molar relation:
0 = Normal
1 = Half cusp
2 = Full cusp

NEED FOR IMMEDIATE CARE AND REFERRAL	
Life-threatening condition <input type="text"/> (177)	0 = Absent 1 = Present 9 = Not recorded
Pain or infection <input type="text"/> (178)	
Other condition (specify)..... <input type="text"/> (179)	
Referral <input type="text"/> (180)	0 = No 1 = Yes 9 = Not recorded

NOTES