

**COMPARATIVE EVALUATION OF EFFECTIVENESS OF
SCHOOL DENTAL HEALTH EDUCATION PROGRAM AMONG
SCHOOL CHILDREN OF 8-10 YEARS OLD WITH AND
WITHOUT PARENTAL GUIDANCE**

Thesis submitted to

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

In partial fulfilment for the Degree of
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THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY

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DECLARATION BY THE CANDIDATE

I hereby declare that the dissertation titled "**COMPARATIVE EVALUATION OF EFFECTIVENESS OF SCHOOL DENTAL HEALTH EDUCATION PROGRAM AMONG SCHOOL CHILDREN OF 8-10 YEARS OLD WITH AND WITHOUT PARENTAL GUIDANCE**" is a bonafide and genuine research work carried out by me under the guidance of **Dr. C. JOE LOUIS MDS** Professor and Head, Department of Pedodontics and Preventive Dentistry Chettinad Dental College & Research Institute, Kelambakkam, Chennai.

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This dissertation is submitted to **THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY** in partial fulfillment for the degree of **Master of Dental Surgery in the Branch VIII - Pedodontics and Preventive Dentistry**. It has not been submitted (partially or fully) for the award of any other degree or diploma.

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ABSTRACT

INTRODUCTION:

Good oral health in children is important to meet their general health needs. Oral diseases are major health problems, especially in children, owing to their high prevalence and incidence in all the regions of the world. Most of the oral diseases or conditions in children are preventable or treatable. So it is necessary to promote dental health education in schools. Dental health education helps in enriching knowledge and developing life-skills, positive values and attitudes in children. The health and well-being of school staff, families and community members can also be enhanced by programs based in schools. Dental care professionals believe that including parents in health education program result in reductions in caries risk among their children.

AIM:

The aim of the study was to determine the effectiveness of school dental health education program conducted at regular intervals for 8-10 years old school children with and without parental guidance.

MATERIALS AND METHODS:

A total of 120 students of both genders aged 8-10 years were selected. The study was conducted over a period of 36 weeks and sample were randomly selected and allocated into 2 groups without and with parents each group containing 30 boys and 30 girls. In addition Group II included 60 parents. The questionnaire was circulated before the start and end of the study to assess the knowledge and oral hygiene practice of the children. Tooth brush, tooth paste were distributed to the children during the entire period of the study. Oral health

examination was done using DMFT, deft and OHI-S Indices. Initial baseline data was collected. Dental health education was given using video, tooth models and pamphlets after the oral health examination. The children who required treatment were brought to the dental hospital and all their dental needs were treated. Dental examination was carried out again using OHI-S, DMFT and deft index and health education was given at 3rd, 6th and 9th month interval. The result were analyzed using SPSS Software version 20.0

RESULTS:

Around 120 Students were screened. The mean score for pre assessment knowledge and oral hygiene practice score of Group I and Group II were 6.50 ± 1.050 , 6.55 ± 1.268 respectively. The mean score for post assessment knowledge and oral hygiene practice score of Group I and Group II were 7.88 ± 0.761 , 8.03 ± 0.843 respectively. At the baseline the mean score for DMFT, deft, OHI-S score of Group I and Group II were 0.27 ± 0.686 and 0.25 ± 0.680 , 1.80 ± 2.114 and 1.23 ± 1.430 , 1.265 ± 0.642 and 1.405 ± 0.635 respectively. At the end of 9th month mean score for DMFT, deft and OHI-S index for Group I and Group II were 0.57 ± 0.81 and 0.30 ± 0.696 , 2.53 ± 2.054 and 1.52 ± 1.513 , 1.082 ± 0.338 and 0.537 ± 0.370 respectively. This difference was found to be statistically significant for DMFT, deft and OHI-S index ($P < 0.001$). The group without parental presence was showing higher significance due to increase in caries in children.

Keywords:

ORAL DISESES, SCHOOL DENTAL HEALTH EDUCATION, DENTAL CARE PROFESSIONAL, PARENTS.

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LIST OF ABBREVIATIONS

DMFT	-	Decayed, Missing, Filled Teeth Index
deft	-	decayed, extracted, filled teeth Index
OHI-S	-	Simplified Oral Hygiene Index
SPSS	-	Statistical Package for Social Science
WHO	-	World Health Organization
CDC	-	Centre for Disease control
OHE	-	Oral Health Education

INTRODUCTION

Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity [WHO 1948]. In 1986, the WHO further clarified that health is: "A resource for everyday life, not the objective of living. Health is been a positive concept that emphasizes the social and personal resources, and also physical capacities. Socio-economic environment, physical environment, person's individual characteristics and behaviors are the main determinants of health.

Oral health is mirror of the general health; oral tissue is usually sensitive indicators. Sir William Osler (a Canadian Physician) called the oral cavity a mirror of the rest of the body. Good oral health is the basic for general health in children. In worldwide, over the past two decades prevalence rate and pattern of oral disease have changed drastically. In countries where community and school based preventive education programs on oral hygiene is not given there is higher incidence of dental caries.¹

The least treated oral diseases in childhood are dental caries and gingival diseases. Dental caries prevalence is increasing over a period and this may be due to increased availability of processed foods which contains refined sugars. Its progressive nature has become more complex over time. Dental Caries occurs as a result of

complex factors like social, cultural, behavioural, dietary and biological risk factors. The major cause of dental caries are feeding habits in infant's, inadequate exposure to fluoride, decreased saliva, poor oral hygiene and high magnitude of cariogenic microorganism.

An oral disease which leads to tooth loss and pain affects the general appearance of children, nutrition, quality of life growth and development. Most of the oral diseases in children are preventable disease with simple treatment modalities. 80% of school children are affected with dental caries all over the globe, in which the prevalence of dental caries in India was 32.6% and 42.2% at 12 to 15 years, gingivitis was 84.37%.² But the cost of treating dental caries alone can overwhelm a country's health care expenditure. The personal, social and financial status of the patient has direct impact in neglect of the dental diseases in developing countries like India.³

Inadequate or improper oral health care has an adverse effect on children's school performance and their success in later life. When there is no proper knowledge about the oral health there will be delay in treatment which aggravates the condition and directly affects the quality of life for e.g. ability to chew, their selection of food, their appearance and communication. Children with poor oral health are 12 times more likely to have more restricted-activity days than those who do not. Due to poor oral health they lack concentration and miss their school. Pain in oral cavity can

compromise their concentration towards school, thereby affecting not only their education but also play and development and full benefits of schooling.⁴ Due to oral diseases 50 million hours are lost annually from school. It is crucial for the young children to gain knowledge and practices to maintain good health, including oral health. So it is mandatory to promote oral health education in schools children.

Centre for disease control (CDC) defines health education as a planned, sequential, curriculum that addresses the physical, mental, emotional, and social dimensions of health. The methodology is designed to motivate the children to improve their health and prevent diseases and also reduce the health-related risk factors. It enables students to develop knowledge regarding health related issue, its approach and practices.

The main aim of health education is to prevent health problems from happening or re-occurring by organizing health programs, to begin health policies and conducting research.⁵ These actions may be on the part of individuals, families, institutions or communities. Knowledge gained by individuals may enable them to take measures to protect their health. Dental health education has been considered to be an important and integral part of dental health services and it is delivered to individuals, group such as schools, day-care centres and residential settings for adults.

Over the last few decades; dentists are gradually involving in health promotion principles. Their strategy is to reduce current oral disease status and ensuring equal opportunities enable all people to achieve their fullest health potential. Henceforth, health educational interventions began to focus as a core component of those health promotion strategies. In order to prevent the developing countries with oral diseases they have adopted school based oral health education (OHE). Its aim is to improve oral health in child population, development of healthy habits and to create healthy environment in schools and families.⁶

Schools have proven a powerful setting for secondary socialization. A more essential element in education is to cultivate positive values and view to developing them healthy life style. The goals of the interventions is broad, so that knowledge, attitudes, intentions, beliefs and use of dental services, oral health status have all been targeted for change.⁷ The World Health Organization (WHO) recommends oral health promotion should be included into its curricular activities in the schools.

Children's habit can be intercepted as well as prevented and modified in school environment as it is more suitable and comfortable rather than an unfriendly atmosphere like dental clinic. Schools provide effective way of promoting oral health because they cover wide range of children worldwide. Oral health professionals

have a responsibility to educate children about oral diseases and their prevention. Children may additionally be equipped with personal skills that alter them to make healthy decisions, to adopt a healthy lifestyle. Children are particularly receptive during this period and it was suggested that sooner the oral health related behaviour were initiated in life, higher probability for successful long term maintenance.⁸

Children under the age of 12 years generally spend most of their times with parent and guardian, especially mothers referred as “primary socialization”. In these early years child acquires habits, includes dietary habits and healthy behaviours. Studies have suggested that increased incidence of dental caries among children which is mainly due to poor attitude of parents towards their child oral health.⁹ The health and well-being of school staff, families and community members can also be enhanced by programs based in schools. Dental care professional also believes that improving knowledge in parents towards oral health behaviour will result in reductions in caries risk among their child.

Educational strategies focused on parents are highly valuable, since their behaviour regarding oral health has a direct influence on the number of dental caries of their children. Parents perform a central role in the transference of information related to the health and to the healthy behaviour of their children. Mothers are

considered as role model to be followed as they transfer good values and attitudes that are accepted for their children. School dental health education program should be expanded to their parents and responsible adults. Thus, the interventions directed at parent's beliefs and attitudes about oral health may be beneficial in the prevention of oral problems such as dental caries. Parent's attitudes have a positive impact on the state of children's oral health; because the parents control tooth brushing and sugar consumption, the children develop positive oral health habits. The parents are primarily responsible for almost all their children's health problems.

It has been found that the more positive is the parents attitude towards dentistry, the better will be the dental health of their children. Young children's oral hygiene and its outcomes are influenced by their parent's knowledge. Without basic knowledge of caries risk factors, importance of the deciduous teeth, and oral maintenance, it is difficult to prevent oral disease in children.¹⁰ Parent's knowledge and positive attitude towards good dental care are very important in preventive cycle. Therefore, parent's role is fundamental in raising children to practice preventive oral health throughout their lives.¹¹

AIM AND OBJECTIVES

AIM:

To determine the effectiveness of school dental health education program conducted at regular intervals for 8-10 years old school children with and without parental guidance.

OBJECTIVES:

1. To assess the knowledge, attitude and practices of 8-10 years old school going children through pre tested questionnaires.
2. To assess the oral health status of 8-10 year old school going children.
3. To assess the effectiveness of oral health education among 8-10 years old school going children.
4. To assess if parental presence has got any influence on the outcome of school dental education program.

REVIEW OF LITERATURE

John Lee (1976)¹² This study is based on the Parental Attendance at a School Dental Program and Its Impact upon the Dental Behaviour of the Children. One hundred and five children had their parents in attendance and were designated experimental group A; 211 did not and were designated control group B. Behavioural variables compared included dental visits, routine oral hygiene, and the use of fluoride paste and rinse at the sessions. Dental exams both a priori and a posteriori allowed an assessment of the dentition and gingival tissue of both groups. Results showed a significantly greater improvement in both the dental behaviour and dental health of the children whose parents attended the session. These results give valid evidence to the advantage of involving parents in a school based dental program.

Anthony S. Blinkhorn et al (1987)¹³ This study examined one thousand and sixty-seven Scottish school children completed a two-year dental health education and prevention programme. The dental caries was measured using a DMFT index. The hygienist group had a 20% lower incidence of dental decay. Both active groups had significantly ($P < 0.01$) less gingivitis than the control group at the end of the two-year study. Neither of the educational programmes achieved marked success, but the active groups, especially the hygienist group, had a greater understanding of how fluoride worked, realised that controlling the frequency of sweet-eating was important and knew how to control gingivitis. The teacher-based

programme was approximately two-thirds cheaper than the one organized by the hygienist. Neither scheme, unless modified, could be recommended either clinically or economically.

Kay EJ and locker D (1996)¹⁴ This study examined 143 papers relating to dental health education intervention from 1982 to 1984. Each paper was scored by two independent researchers according to twenty predetermined validity criteria. The results of this analysis suggest that further efforts to synthesis current information about dental health education, in a systematic way are required along with maintenance of rigorous scientific standards in evaluation research

Van Palenstein Helderma et al(1997)¹⁵ Conducted a study to evaluate the Effectiveness of an oral health education programme among primary school children between the age group of 9 and 14 years in primary schools in Tanzania. This study aimed to assess the clinical oral health outcome effects among school children participating in a school-based oral health education (OHE) programme. In total, 309 children from the participating schools and 122 children from the non-participating schools were available for the evaluation. The mean DMFT value at baseline was 0.4 and 3 years later 0.9 in both the participating and control schools. In conclusion, the present study shows that the implemented school-based OHE programme did not result in significant reductions of the clinical parameters measured.

Redmond CA et al (1999)¹⁶ Investigated the value of the school based dental health education program in terms of changes in

knowledge, reported behaviours and plaque scores by using a cluster randomized control study design involving 2678 pupils with a mean age of 12.1 years attending 28 schools. The result reported frequency of brushing did not change, but the group who had received 12 months of the intervention were more likely ($P < .05$) to brush for over a minute. At six months the early intervention group had a statistically significant, 13% reduction in the mean proportion of sites with plaque compared with the late intervention group ($P = .043$). Hence this trial demonstrated that the intervention program resulted in an improvement in knowledge of dental diseases and an increase in the duration of brushing. Hence there is a positive association between the oral hygiene importance and reduction in gingival bleeding.

Vigild M et al (1999)¹⁷ Conducted a study to assess the Oral health behaviour of 12-year-old children in Kuwait. The sample included 500 12-year-old schoolchildren (250 boys and 250 girls) selected from schools in Kuwait. The results are as follows: During the previous 12 months, 28% of the children had experienced oral health problems ± toothache (10%), or had felt discomfort (18%) either often or occasionally. The children reported that they needed oral hygiene instruction (71%), fillings (32%) and tooth extraction (23%). For 53% of the children the reason for the most recent visit to a dentist was pain or problems with teeth or gums. At their last dental visit 26% of the children had undergone a tooth extraction. The consumption of sugary foods and drinks was extremely high.

Oral health education and oral health care programmes should be established in secondary schools in Kuwait to influence the oral health behaviour of the children and to avoid further deterioration in their oral health.

Mellanby et al (2000)¹⁸ critically reviewed available comparative research regarding peer-led and adult-led school health education. The authors have evaluated school based health education programs which have set out to compare the effects of peers or adults delivery the same material. The authors conclude that identified studies indicated that peer leaders were at least as, or more, effective than adults but also suggests extensive research in this area for definitive answers

Okada et al (2002)¹⁹ The study was done to examine the simultaneous inter-relationships between parents' oral health behaviour and the oral health status of their school children. The child's dental examination was performed using the World Health Organization (WHO) caries diagnostic criteria for decayed teeth (DT) and filled teeth (FT). The Oral Rating Index for Children (ORI- C) was used for the child's gingival health examination. Hiroshima University Dental Behavioural Inventory (HU-DBI) was used for the assessment of the parents' oral health behaviour. A parent-child behavioural model was tested by the linear structural relations (LISREL) programme. This study concluded that parent's oral health behaviour could influence their children's gingival

health and dental caries directly and/or indirectly through its effect on children's oral health behaviour.

Petersen PE et al (2004)²⁰ conducted a study among primary school children in Hongshan District, Wuhan city, Central China. The participants were 803 children and their mothers, and 369 teachers were included at baseline. After three years, 666 children and their mothers (response rate 83%), and 347 teachers (response rate 94%) remained. In experimental schools, mothers showed significant beneficial oral health developments, while teachers showed higher oral health knowledge and more positive attitudes, also being satisfied with training workshops, methods applied, materials used and involvement with children in OHE. The authors concluded that the programme had positive effects on gingival bleeding score and oral health behaviour of children, and on oral health knowledge and attitudes of mothers and teachers. No positive effect on dental caries incidence rate was demonstrated by the OHE programme.

Carlos Alberto Conrado et al (2004)²¹ The main purpose of this study was to evaluate the preliminary results of a school-based oral health educational strategy adopted in public primary schools from the city of Maringa, State of Parana, Brazil. The study sample was composed by 556 children and adolescents aged 6 to 17 years old, 124 schoolteachers and a group of 55 mothers. A statistically significant improvement in their oral hygiene index ($p < 0.001$) was recorded. The results achieved suggest an encouraging tendency towards the improvement in the levels of oral health care among the

school-age youths studied. They also point out the need of intensifying the preparation of schoolteachers in oral health topics, as well the instructions to the mothers for their oral health care. Moreover, they highlight the importance of the continuous implementation of school-based programs to promote the oral health

Bondarik Elena et al (2004)²² Conducted a study to collect basic data of dental status of 6 and 12 years old in Belarusian urban and rural areas and monitoring of dental status, to analyze oral health habits of school children and mothers according to urbanization and to find out the relation between mother's educational background and children's oral health habits and also impact on their own dental knowledge, attitudes and practices. Results of present investigation show that adult's oral health habits and level of dental knowledge are key information in realization of children oral health programme.

Al-Omiri M.K et al (2006)²³ conducted a study among 10 to 16 year old school going children in North Jordan to assess the Oral Health Attitudes, Knowledge and Behaviour Among School going Children. School children (n=557) of an average age of 13.5 years attending public schools in North Jordan were recruited into this study. The study population showed higher awareness of caries than periodontal conditions. The children in this study also recognized the importance of oral health to the well-being of the rest of the body. Parents were not proactive in making sure that their children received regular dental care. Parents' knowledge and attitudes about

the importance of oral health care and their fears about dental treatment influenced their children's dental care. The results of this study indicate that children's and parents' attitudes toward oral health and dental care need to be improved. Comprehensive oral health educational programs for both children and their parents are required to achieve this goal.

Yee et al (2006)²⁴ The main purpose of this study was to evaluate the oral cleanliness of school children in the District of Sunsari, Nepal. A total of 600, 12-13-year-old and 600 15-year-old school children were examined by trained examiners using the simplified oral hygiene index (OHI-S). The mean OHI-S for urban 12-13-year-old school children was 0.98 compared to 1.34 for school children of rural towns and 1.44 for school children of rural villages and these differences in mean OHI-S were statistically significant ($P < 0.005$). In the 15-year-old age group, urban school children had a mean OHI-S score of 1.00 compared to 1.37 for rural towns and 1.43 for rural villages. The variance in the mean OHI-S scores were statistically significant ($P < 0.005$).

Sagheri D et al (2007)²⁵ conducted a study to assess the oral health of school age children and the current school based dental screening programme in Freiburg, Germany among 6 – 12 year old school going children. The aim of this cross-sectional study was to report on the dental caries levels of school-age children stratified into these three different school types at secondary school level to enable oral healthcare personnel to administer a focused, school-

based dental screening and education programme according to patients' needs rather than a uniform dental examination. Results: A total of 322 12-year-old children participated. The mean DMFT was 0.69. An examination of the distribution of the DMFT score revealed that its distribution is positively skewed. The non-parametric Kruskal-Wallis H-test showed a highly significant difference between median scores across the different school types (P-value = 0.004). The significance was a result of the 'Gymnasium' distribution of DMFT scores which differed markedly from the other two school types.

Nash D et al (2008)²⁶ compiled a profile of the oral healthcare team in countries with emerging Economies. They concluded that

1. Oral health is a critical and integral dimension of general health and well-being.
2. Gaining and maintaining the benefits of oral health is a social good and should be an entitlement ensured by a society for all of its citizens.
3. Poverty and ignorance are significant barriers to achieving oral health in a population.
4. An inadequate oral health workforce is an additional barrier to achieving oral health. Therefore, developing a well-educated/ well-trained oral healthcare team is essential to effecting oral health for a nation's population.
5. Each country must develop a strategic plan for the oral health of the public that is based on the unique demographics of the country

and the epidemiology of its oral diseases. Public health professionals have a unique role to play in developing such a plan. When these individuals are not available in an emerging economy, advice and consultation will have to be gained from international experts in the field.

6. A comprehensive oral health team consists of: dentists, specialist dentists, dental therapists and dental hygienists (or a combination of the two – an oral health therapist), denturists, expanded function dental assistants/dental nurses and community oral health workers/aides.

7. The profile of the oral healthcare team, and the numbers emerging economy, should reflect the specific needs and circumstances of the country.

8. Prevention of oral disease is an ultimate goal and is to be desired above therapy. Therefore, an emerging economy should give priority consideration to funding and implementing all appropriate preventive strategies for its population.

Tai B-J Jiang et al (2009)²⁷ Conducted a study to assess the outcome of oral health promotion in school children over a 3-year period in Yichang City, Hubei, China. Data on dental caries, plaque accumulation, and sulcus bleeding were collected by clinical examination, while behavioural data were gathered by self-administered questionnaires. There was no statistically significant difference observed in the 3-year net mean DMFT increment score between the two study group ($P>0.05$). The 3-year net mean DMFS

increment score was 0.22 in the intervention schools and 0.35 in the control schools ($P < 0.013$). A statistically significant difference in mean plaque ($P < 0.013$) and sulcus bleeding ($P < 0.005$) increment scores after 3 years was found between the two groups. The study suggests that the school-based oral health promotion was an effective way to reduce new caries incidence, improve oral hygiene and establish positive oral health behavioural practices in the targeted school children.

Jurgensen N (2009)²⁸ conducted a cross sectional survey to assess the Oral health and the impact of socio-behavioural factors of 12-year old school children in Laos. The aims of this study were to: assess the level of oral health of Lao 12-year-olds in urban and semi urban settings; study the impact of poor oral health on quality of life; analyze the association between oral health and socio-behavioural factors; investigate the relation between obesity and oral health. Results are as follows: Mean DMFT was 1.8 (SEM = 0.09) while caries prevalence was 56% (CI95 = 52-60). Prevalence of gingival bleeding was 99% (CI95 = 98-100) with 47% (CI95 = 45-49) of present teeth affected. Trauma was observed in 7% (CI95 = 5-9) of the children. High decay was seen in children with dental visits and frequent consumption of sweet drinks. Missed school classes, tooth ache and several impairments of daily life activities were associated with a high dD-component. No associations were found between Body Mass Index (BMI) and oral health or common risk factors. The multivariate analyses revealed

high risk for caries for children with low or moderate attitude towards health, a history of dental visits and a preference for drinking sugary drinks during school hours. Although the caries level is low it causes considerable negative impact on daily life. School based health promotion should be implemented focusing on skills based learning and attitudes towards health.

Rosa Amalia et al (2012)²⁹ Conducted a study to assess the effectiveness of a school based dental programme (SBDP) in controlling caries by measuring the relationship between the SBDP performance and caries experience in children aged 12 in Yogyakarta Province, Indonesia, by taking into account influencing factors. Caries was assessed using WHO criteria whereas behaviour and socio-demographic factors were collected using a questionnaire administered to the children. The decayed, missed, and filled teeth (DMFT) of children in good SBDPs (2.8 ± 2.4) was lower than that of the counterparts (3.8 ± 3.4). The study suggests that the differences in DMFT of children in good and poor performance SBDPs were caused by relation to social factors rather than by relation to oral health service activities.

Abdul Haleem et al (2012)³⁰ Conducted a study to compare the effectiveness of dentist-led, teacher-led, peer-led and self-learning strategies of oral health education. A two-year cluster randomized controlled trial following a parallel design was conducted. The present paper discusses the findings of the study pertaining to the baseline and final outcome examination. All the three educator-led

strategies of OHE had statistically higher mean of oral health knowledge (OHK), oral health behaviour (OHB), Oral hygiene status (OHS) and combined knowledge, behaviour and oral hygiene status (KBS) scores than self-learning and control groups ($p < 0.001$). The mean OHK, OHS, KBS scores of the three educator-led strategies did not differ significantly. The peer-led strategy was, however, found to have a significantly better OHB score than the respective score of the teacher-led strategy ($p < 0.05$). The self-learning group had significantly higher OHB than the control group ($p < 0.05$) but the OHK, OHS, KBS scores of the two groups were not significantly different. The peer-led strategy, however, is almost as effective as the dentist-led strategy and comparatively more effective than the teacher-led and self-learning strategies in improving the oral health behaviour.

Aline Rogeria Freire de Castilho et al (2012)³¹ Conducted a study to review current models and scientific evidence on the influence of parents' oral health behaviours on their children's dental caries. A total of 218 citations were retrieved, and 13 articles were included in the analysis. The studies were eligible for review if they matched the following inclusion criteria: (1) they evaluated a possible association between dental caries and parents' oral-health-related behaviours, and (2) the study methodology included oral clinical examination. This study concluded that parents' dental health habits influence their children's oral health. Oral health education programs aimed at preventive actions are needed to provide children

not only with adequate oral health, but better quality of life. Special attention should be given to the entire family, concerning their lifestyle and oral health habits.

Jurgensen et al (2012)³² Conducted a study to review the range of school-based approaches to oral health and describes what is meant by a Health Promoting School. The Ottawa Charter for Health Promotion noted that schools can provide a supportive environment for promoting children's health. However, while a number of well-known strategies are being applied, the full range of health promoting actions is not being used globally. A greater emphasis on integrated health promotion is advised in place of narrower, disease- or project-specific approaches. Recommendations are made for improving this situation, for further research and for specifying an operational framework for sharing experiences and research.

Mazah Salah Mudathir et al (2012)³³ Conducted a study to assess knowledge about tooth decay and practice towards oral health education among basic school teachers. Also to determine their decayed, missed and filled tooth index (DMFT) and Oral hygiene index (OHI). Subjects and Cross-sectional study among 184 basic school teachers, working in schools in Khartoum province. An interview questionnaire consisting of 15 questions covering their oral hygiene habits, basic knowledge about tooth decay, willingness to participate in school based oral health programs. Result showed that the mean DMFT index was 11.59 ± 5.09 . The oral hygiene condition was assessed via OHI-Simplified, 53.3% had good oral

hygiene, 44% fair and 2.7% poor. Knowledge assessment revealed that 54.9% thought that dental caries is caused mainly by bacteria and sugars and 31.0% believed that tooth decay cannot be prevented. Significant association was found between teachers' age and their source of information about oral health ($p=0.036$). Regarding practice towards oral health 60.3% of the teachers claimed spending time promoting for oral health. Basic school teachers were generally well informed about tooth decay but some deficiencies were noticed.

Aurangjeb AM (2013)³⁴ The main purpose of the study is to find the effect of parent's education on child's oral health. This study was done to assess the relation between parent's education and their child's oral health. Parents of children aged 3-12 years, attending the Dhaka Project School Dokkin Khan, Uttara Dhaka were invited to participate in the study. The sample comprised of 251 parents either mother or father, with the mean age of children being 5.65 years. Mean plaque index 1.60, calculus index 1.30, Gingivitis index 1.11, decayed teeth index 1.69, missing teeth index 0.22 and filled teeth was 0.07. Parents with higher educational qualification and information gained through dentist had a better knowledge about child's oral health.

Viany Kumar Bhardwaj et al (2013)¹ The study has been undertaken to evaluate the impact of oral health education on the status of plaque, gingival health and dental caries among 12 and 15 years old children attending government school in Shimla city. Two

hundred and seventy six school children participated in the study. Plaque, gingival and caries status was assessed by using Silness and Loe plaque index, Loe and Silness gingival index and WHO modified DMFT index, respectively. Data was analyzed using the software SPSS version 15. Paired t- test and Wilcoxon signed rank sum test were used appropriately for statistical comparisons. P value ≤ 0.05 was considered statistically significant. Coordinating efforts should be enhanced between school personnel, parents and health professionals to ensure long term benefits of such program.

John BJ Asokan S et al (2013)³⁵ conducted a study to assess the impact of three different health education methods among pre-schoolers. The study group included 100 pre-schoolers of the same socio-economic status randomly selected and divided into four groups. Debris index (DI-S) was recorded for all children followed by the dental health education. Group A received dental health education from the Dentist; Group B from the class teacher trained by the Dentist and Group C from the dental residents dressed mimicking cartoon characters. Group D acted as the control group. Post-intervention evaluation program was carried out after 3 months. Comparison of pre- and post-intervention data showed that there was a statistically significant improvement in the (DI-S) scores in all groups except the control group. Group C showed a significant improvement compared to the other Groups A, B, and D ($P < 0.04$). Conclusion: Drama as a method of health education can have a bigger impact on the oral health attitude and practices of the

pre-schoolers. These modes can serve to reinforce as well as improve the oral health practices among pre-school children.

Elham Bozorgmehr et al (2013)³⁶ The main purpose of the study to evaluate the relationship between oral health behaviour of parents and oral health status and behaviour of their children in a sample of preschool children in Iran. About 222 parents and children participated in the study. There was a significant relationship between history of having dental problems in parents and dmft index in their children ($P=0.01$). There was a significant relationship between parental frequency of tooth brushing and child frequency of tooth brushing ($P=0.05$); however there was no significant relationship between parental frequency of dental visits and those of their children ($P=0.01$). The study concluded that some important health behaviours in parents, such as tooth brushing habits are important determinants of these behaviours in their young children. So promoting parent knowledge and attitude could affect their children oral health behaviour and status.

Rubenice Amaral da Silva (2013)³⁷ Conducted a study to evaluate mothers who participated in an educational and preventive program for infants in relation to their knowledge on oral health practices. The oral cavities of the infants were also examined regarding: level of plaque, gingival bleeding, and dental caries. Then, educational lectures were ministered and, after a year of follow-up, new interviews and clinical examination were performed. For statistical analysis, the chi-square and Fisher exact tests were applied, being

significant $p < 0.05$. Before the educational lectures, 93% of the mothers performed oral hygiene of their babies and 57.3% performed it at daytime and night time. After the lectures, all mothers performed the oral hygiene ($p > 0.02$) and 74.7% performed it at daytime and night time ($p = 0.01$). There were no differences regarding the consumption of cariogenic food in the initial and final questionnaires ($p > 0.05$). Initially, 5.6% of dental surfaces had caries; 29.7%, plaques; and 11.9%, gingival bleeding. After the lectures, only 0.4% of the dental surfaces had caries ($p < 0.0001$); 2.4%, plaque ($p < 0.0001$); and 10.61%, gingival bleeding ($p < 0.0001$). Knowledge acquisition is essential to improve oral health conditions.

Raghavendra Shanbhog et al (2013)³⁸ Conducted a study to determine the prevalence and severity of oral condition related to untreated dental caries with PUFA index and to relate period of institutional stay, oral hygiene practice and diet of orphan children to caries experience ratio. The overall prevalence of PUFA was 37.7%. 31.1% children showed one or more pulpally involved tooth in their oral cavity. Correlation between periods for being the child in the institute to DMFT showed negative value indicting decrease in DMFT as the duration of stay in orphanage increases. The result show oral health condition in orphan children was neglected. Children from this disadvantaged background have shown a high prevalence of dental caries with low dental care utilization. PUFA

index is an effective index in evaluating clinical consequences of untreated caries.

Byalakere Rudraiah Chandrashekar et al (2014)³⁹ The objective of this study was to compare the oral hygiene, plaque, gingival, and dental caries status among rural children receiving dental health education by qualified dentists and school teachers with and without supply of oral hygiene aids. The oral hygiene, plaque, gingival, and dental caries status was assessed at baseline and 6 months following the intervention. SPSS 16 was used for analysis. The pre-intervention and post-intervention comparison within each group revealed a substantial reduction in mean oral hygiene index-simplified (OHI-S), plaque index (PI), and gingival index (GI) at post-intervention compared to baseline in group 4 (1.26, 0.87, and 0.74, respectively) followed by group 3 (0.14, 0.37, and 0.12, respectively). The OHI-S, PI, and GI scores increased in group 1 (0.66, 0.37, and 0.34, respectively) and group 2 (0.25, 0.19, and 0.14, respectively). Mean decayed, missing, filled surfaces score between the groups was not statistically significant at baseline and post-intervention. The dramatic reductions in the OHI-S, PI, and GI scores in the group supplied with oral hygiene aids call for supplying low cost fluoridated toothpastes along with toothbrushes through the school systems in rural areas.

Yatish Kumar Sanadhya (2014)⁴⁰ This study assesses the effectiveness of oral health education on oral health knowledge, attitude, practices and oral hygiene status among 12–15-year-old

school children of fishermen of Kutch district, Gujarat, India. A before-and-after experimental study was conducted among all (n = 205) the 12–15 year old children from two schools of Bhadreswar village of Mundrataluka of Kutch district, Gujarat, India from January 2013 to December 2013. At baseline, children were assessed for oral health knowledge, attitude and practices using a self-administered structured questionnaire and oral hygiene was assessed using Oral Hygiene Index-Simplified (OHI-S). Oral health education was provided after baseline assessment, at 3 months and at 6 months. Follow up study was done after 1 year from baseline. Statistical tests applied were Independent t test, paired t test and McNemar test. The results of the study reflects the accomplishment of upgrading oral health knowledge, attitude, practices and oral hygiene status of fishermen children through school oral health education programme.

Maryam Amin et al (2014)⁴¹ This study evaluates the impact of an educational workshop on parental knowledge, attitude, and perceived behavioural control regarding their child's oral health. The impact of the workshop was evaluated by a questionnaire developed based on the theory of planned behaviour. A total of 105 parents participated in this study. Participants were mainly mothers (mean age 35.03 ± 5.4 years) who came to Canada as refugee (77.1%) and had below high school education (70%). Parents' intention to take their child to a dentist within six months significantly altered after the workshop (P value < 0.05). A one-

time hands-on training was effective in improving parental knowledge, attitude, perceived behavioural control, and intention with respect to their child's oral health and preventive dental visits in African immigrants.

Petersen et al (2014)⁴² Conducted a two-year study assessed the benefit of an enhanced oral health promotion program combined with a closely supervised tooth brushing program in schools. The DMFT and DMFS increments (“enamel and dentine”) were 1.19 and 1.91 for the control group and 1.04 and 1.59 for the intervention groups. These represent 12.6% and 16.8% reductions in caries respectively. The DMFT and DMFS increments (“dentine threshold”) were 0.26 and 0.44 for the control group and 0.19 and 0.29 for the intervention group, representing 26.9%, and 34.1% reductions in caries incidence respectively. This study documents the positive effect from use of fluoridated toothpaste (1,450 ppm F- and 1.5% arginine) administered by schoolteachers and undertaken via an enhanced school oral health program. Optimizing oral health interventions for young children in Thai schools may have a significant impact on caries incidence resulting in reductions of up to 34% reductions in caries for all schools included in the study and up to 41% for the most cooperative.

Anupriya et al (2014)⁴³ The study was taken up with the aim to evaluate the oral health status and treatment need in the School going children of Nagrota Bagwan Block of Kangra District, Himachal Pradesh. A total number of 3069 school children in the

age group of 5-12 years studying in 96 government primary schools of study area were surveyed to find out the Oral Hygiene Index simplified (OHI-S) scores, community periodontal index (CPI) scores, dental caries and treatment need using dentition status and treatment need index (WHO diagnostic criteria, 1997). The overall caries prevalence of subjects was 58.4% with high caries prevalence in females as compared to males and in 9-12 year's age group as compared to 5-8 years age group. The mean dmft/DMFT was 2.05 ± 4.13 and 2.56 ± 4.20 in 5-8 years and 9-12 years age group, respectively. Treatment need observed was 62.3% and 75.3% in 5-8 and 9-12 year's age group, respectively. The study demonstrated that school children in Nagrota Bagwan, Kangra district suffer from high prevalence of dental caries and have high treatment need as well as poor oral hygiene and gingival health status.

Sunil Lingaraj Ajagannavar et al (2014)⁴⁴ The aim was to assess the association of Dental Neglect (DN) with dental caries and oral hygiene among adolescents in Virajpet, India. Oral health status was clinically assessed using simplified oral hygiene index (OHI-S) and dental caries through dentition status as per WHO criteria. The present study revealed that variations in DN exist in relation to socio-demographic characteristics and pattern of dental attendance. In addition, oral health status was significantly associated with DN among adolescents.

RuiHou et al (2014)⁴⁵ This study is conducted to identify the oral health practices and access for care of graduating senior high school

Tibetan students in Shannan prefecture of Tibet. The dental caries prevalence (39.96%) and mean DMFT (0.97) were high in Tibetan students. In community periodontal indexes, the detection rate of gingivitis and dental calculus were 59.50% and 62.64% respectively. Oral hygiene index Simplified was 0.69 with 0.36 and 0.33 in debris index – simplified and calculus index-simplified, respectively. Community dental fluorosis index was 0.29, with 8.13% in prevalence rate. The questionnaire showed students had poor oral health practices and unawareness for their needs for oral health services. Tibetan students had higher prevalence of dental diseases and lower awareness of oral health promotion and education and Oral health education and local dentist training should be strengthened to get effective prevention of dental diseases.

Denise Duijster et al (2015)⁴⁶ The objective of this qualitative study was to explore parents' perceptions of barriers and facilitators that influence these oral health behaviours in children. Focus group interviews were conducted on the basis of a pre-tested semi-structured interview guide and topic list. Analysis of interview transcripts identified many influences on children's oral health behaviours, operating at child, family and community levels. Perceived influences on children's tooth brushing behaviour were primarily located within the direct family environment, including parental knowledge, perceived importance and parental confidence in tooth brushing, locus of control, role modelling, parental

monitoring and supervision, parenting strategies and tooth brushing routines and habituation. This qualitative study provided detail regarding parental views on the influences on children oral health behaviours and their opinions on what further support is needed to promote children's dental health. Parents' suggestions for professional oral health support can guide the development or improvement of caries preventive interventions.

Martina V Angelopoulou et al (2015)⁴⁷ This study evaluates the effectiveness of experimental learning (EL) oral health education to traditional lecturing (TL), on enhancing oral health knowledge, attitude and behaviour as well as oral hygiene, gingival health and caries of 10 year old children. 84 children were recruited for the EL and 100 for the TL group from 3 locations in the Greece. EL group had statistically significant better hygiene than the TL at 6 months ($p < 0.05$). Within the same group, both groups had enhanced oral health knowledge at 16 and 18 months ($p < 0.05$) and improved oral health behaviour ($p > 0.05$) and attitude ($p > 0.05$) at 6 months in comparison to baseline. EL program was found more successful than TL in oral hygiene improvement. Both oral health education programs improved the oral health knowledge, attitude and behaviour of children.

AdasSaliba Gabrin et al (2015)⁴⁸ This study evaluates parents' attitudes about their children's oral health and to determine the prevalence of dental caries. A clinical oral exam was performed in order to determine the decayed, missing and filled teeth (dmft) and

Index of Oral Health–Simplified (IOH–S). The state of the children’s oral health was good; the mean of the decayed, missing and filled teeth (dmft) was 0.68 (Standard deviation = 1.70). The parents’ attitudes related to oral health were not very good. Many of them did not floss their children’s teeth; the bottle-fed children did not brush after feeding. The consumption of sugar was associated with the presence of dental plaque in the children ($p=0.05$). Nevertheless, in most cases, tooth brushing was performed by the parents and was associated with a good dmft index in the children ($p=0.04$). The state of children’s oral health in the present study was good. However, the parents’ attitudes in relation to oral health were not good.

Yogesh Kumar et al (2015)⁴⁹ Conducted a study to compare the effectiveness of conventional and game-based teaching on the level of knowledge and practice regarding oral hygiene among 7 to 10-year-old school children. A total of 60 children aged 8 to 10 years were randomly divided into two groups: groups A and B. Children in group A were given oral health education through flash cards once daily for 7 days. Children in group B were educated through the play-way method, i.e. connect the dots game combined with flash cards. There was significant increase in oral hygiene scores and decrease in debris scores compared to baseline in both groups at 1 week and 1 month. At 3 months interval, both groups showed a decrease in oral hygiene scores from baseline with group B showing highly significant reduction. The mean increase in knowledge score

was also significantly better in group B ($p < 0.05$). The connect the dots game that includes oral health guidelines including good dental hygiene and dietary habits can thus be an effective intervention aid for teaching the basic oral health concepts among school going children.

Seyed Jalal Pourhashemi et al (2015)⁵⁰ The main purpose of this study was to assess the relationships between dental health and educational performances in elementary students. Oral health status was assessed based on the World Health Organization (WHO) standards using caries and oral hygiene indices. The indices of dental caries in primary or permanent teeth were not significantly associated with school performances ($P \geq 0.140$). The analysis revealed that the factors i.e., housing status and living with the parents are statistically associated with the oral health indices ($P = 0.050$ and $P = 0.080$; respectively) and on the other hand with school performances ($P = 0.020$ and $P = 0.010$; respectively). Children with poorer oral health status were more likely to perform poorly in school. Socio-economic status of the students affects negatively both school performances and oral health care.

Chanchal Gangwar et al (2015)⁵¹ Conducted a study to assess and compare dental caries and oral hygiene status of child labourers and school children of Bareilly city. Decayed, missing, and filled teeth index (DMFT) and oral hygiene index - simplified (OHI-S) were used. The mean age of child labourers and school children was 13.07 ± 1.3 and 13.03 ± 1.5 . The majority of child labourers

(82.8%) had no mouth rinsing habit. Tobacco-related habits were found among 37.8% of child labourers. Most of the child labourers (91%) never visited dentists. The mean DMFT was 3.8 ± 1.7 and 2.9 ± 1.6 for child labourers and school children, respectively, ($P < 0.05$). The mean OHI-S score was 2.3 ± 0.70 and 2.1 ± 0.9 in child labourers and school children, respectively, ($P < 0.05$). The study demonstrated that the child labourers have poorer oral health status with respect to dental caries and oral hygiene compared to school children.

Giuseppinan Lagana et al (2015)⁵² Conducted a study to determine the oral health conditions of an adolescent population of Tirana. A clinical observation without radiographs was conducted in the medical room of the schools during the 2012-2013 school years. Very severe and severe orthodontic treatment need, grade 5 and 4 of IOTN (Index of Orthodontic Treatment Need), were found in 17.0 % of the sample. DMFT (Decayed, Missing and Filled Teeth) was 4.9, whereas OHI (Oral Hygiene Index) was documented in the highest number of subjects ($n=384$), 32 % of the total sample possessed “good” grade of oral hygiene. CPI (Community Periodontal Index) was observed at score 0 (healthy gingival condition) in most of the subjects (53.1 %), score 1 (gingival bleeding) in 33.4 % of the total sample. PI (Plaque Index) results showed 43.9 % of the sample (527 subjects) with score 0. The study findings highlight the need for preventive care programs to improve oral health conditions as well as to reduce oral pathology risk factors in Albania.

Nishi Gupta et al (2015)⁵³ To assess the relationship among the oral health status, oral hygiene practices, and habits of primary and middle school teachers in Mangalore city. Oral hygiene practices and habits were assessed using a questionnaire. The oral health status of the teachers was examined using simplified oral hygiene index, gingival index, and caries experience was scored using the decayed, missing, and filled teeth index. With respect to caries experience and oral hygiene practices, as the frequency of brushing increase, there was a decrease in the number of decayed and missing teeth and increase in the number of filled teeth ($P < 0.05$). The findings of this study highlight the importance of proper oral hygiene habits and its relationship of oral health status and recommend the continuous implementation of school-based programs to promote the oral health.

Sharma et al(2015)⁵⁴ The study was taken up with the aim to study the prevalence of dental caries to improve oral health through health education, early diagnosis and treatment, and to evaluate the impact of intervention (treatment and oral health education) on oral health in the school going children of Nagrota Bagwan Block of Kangra district, Himachal Pradesh, India. Oral health education and treatment were provided and the data were collected again after 6 months of intervention. The overall caries prevalence of subjects decreased from 58.4% at the baseline to 45.4% after 6 months following intervention with high caries prevalence in females as compared to males and in the 9-12 years age group as compared to

the 5-8 years age group. The findings of the study demonstrated that schoolchildren in Nagrota Bagwan Block of Kangra district, Himachal Pradesh, India suffer from high prevalence of dental caries. Oral health education and intervention conducted after 3-month intervals were effective in reducing dental caries experience in schoolchildren.

Effat Khodadadi et al (2016)⁵⁵ Conducted a study to determine the relationship between parents' oral health literacy (OHL) and their children's dental health status in Babol, Iran. We measured dmft index only for primary dentition; during examination the accompanying parent completed the "Oral Health Literacy-Adults Questionnaire". Children's mean age was 55.1 months (SD: 13.7), while 47% were girls. Mean children's dental caries, missing, filling, and mean dmft index were 6.5, 0.4, 1.2, and 8.2 respectively. Parents with inadequate OHL had children with more dental caries ($p=0.005$), however this relation had no significance while controlling for background factors. Increasing children's dental fillings was significantly related with families living in urban regions ($p=0.01$, 95% CI: 0.11 to 1.12), and parents with adequate OHL ($p=0.02$, 95% CI: 0.08 to 1.05). Inadequate parents' OHL was associated with children having high dental caries and less dental fillings. Therefore, providing interventions to improve parents' OHL would be valuable in children's dental health promotion programs, especially in countries with a developing oral health system.

Deepthi Athuluru et al (2016)⁵⁶ To assess the prevalence of oral diseases in 5, 12, 35–44, and 65–74 years old population in rural areas of Nellore district, Andhra Pradesh, India. Among 35–44 and 65–74 years age group, 54.1% and 42.2% of the population showed poor oral hygiene status. At age 12 years, 51% of children had caries; mean decayed, missing, filled teeth was 3.24 in 35–44 years and 12.01 in 65–74 years. Extraction was the most required treatment (52.1%) for older people, pulp care therapy for 12 years old (16.5%) and 35–44 years old (23.2%). Community periodontal index score 2 was dominant in 12 years old (30.5%) and 35–44 years old (54.6%) and score 3 in 65–74 years (46.9%) population. Definite malocclusion was seen in 18% of 12 years old population. All the independent variables were related to caries and periodontal status ($P < 0.05$). The study population was characterized by high prevalence of dental caries, periodontal diseases, and poor oral hygiene status, and age of the population is the most associated factor for dental caries and periodontal diseases.

Roomani Srivastva et al (2016)⁵⁷ Conducted a study to assess the effectiveness of two different health education interventions in 12-year-old school children in Bengaluru. Oral prophylaxis for both the groups was done at baseline. Assessment of oral hygiene was done for all the subjects using Silness and Loe plaque index and oral hygiene index-simplified (OHI-S) along with reinforcement of health education at 3, 6, and 12 weeks. A statistically significant difference was found between Group A and Group B in the plaque

scores at all 3 follow-ups ($P < 0.001$) and in OHI-S scores last two follow-ups ($P < 0.05$). There was an increase in knowledge score post intervention for both groups which was significant; however only Group B showed significant improvement in practice ($P < 0.05$). Oral health education conducted by the dentist was found to be more effective than that given by a trained teacher.

Masoomeh Shirzaiy (2016)⁵⁸ The present study was done to evaluate DMFT and CPTIN indices and personal behaviours in the 12-year-old school children in the city of Zahedan. DMFT and CPITN indices of 942, 12 year old school children were evaluated. The mean DMFT in the studied population was 0.94 ± 0.5 (1.18 ± 0.5 in girls and 0.7 ± 0.38 in boys) Tooth decay component was the essential component of DMFT index (0.62 for boys and 1 for girls). Dental caries rate in two genders no significantly differed ($P < 0.05$) 18% of students (12.7% in girls and 5.3% in boys) had a CPTIN score 0. 67% of individuals (32.7% in girls and 34.3% in boys) had a CPTIN score of 1. In addition, 15% of subjects (7.9% in girls and 7.1% in boys) had a CPTIN score of 2. A total of 47.8% subjects who brushed before sleeping had good OHI-s while only 18.6% of subjects who never brushed had good OHI-s. This difference was significant ($P < 0.05$). Dental caries rate was low in studied population. Periodontal health status in girls was better than boys. People who brushed their teeth before sleeping had a desirable oral health status. For 12 year old children, oral health education is necessary in improving oral health.

Shivananda Gudal Soumya et al (2017)⁵⁹ This study evaluates oral health status of school going children among 5-15-year-old in Shimoga city. The deft among 5-6-year-old children was 3.36 ± 3.511 , deft and DMFT among 9-10-year-old was 2.55 ± 2.497 and 0.45 ± 0.996 respectively and DMFT among 14-15-year-old was 1.34 ± 1.832 . The caries prevalence among 5-6-year-old was 68.8%, 9-10-year-old was 77.2% and 14-15-year-old was 48.9% and overall prevalence of dental caries was 65.3% which was statistically significant. Among 9-10-year-old oral hygiene was good in 85.4%, fair in 13.5% and poor in 1% of school children and among 14-15-year-old oral hygiene was good in 77.4%, fair in 22.2% and poor in 0.4%. Overall 81.7% of children had good oral hygiene. The prevalence of dental fluorosis was 14.5%. Oral hygiene status is found to be good among both the private and government school children. So the dental awareness is required among children of government school.

Vinej Somaraj et al (2017)⁶⁰ School health is an important aspect of any community health programs. School based oral health programs give children a chance to experience optimal oral health, but developing relevant programs that address the needs of today's children is a complex task. Our increasingly heterogeneous society possesses challenges to the school health program planner. School based oral health programs that are designed to help children must be relevant and offer interventions based on current research findings. Schools provide an opportunity for learning new things

that make them suitable for the presentation of oral health information.

Thiruvnkadam Gopalan et al (2018)⁶¹ The purpose of the study was to assess the impact of school absenteeism, academic performances, and self-esteem of school-going children on their oral health status. Rosenberg self-esteem scale was used to assess the self-esteem of the children. Clinical examination for each child was done to assess the Decayed, Missed, and Filled Teeth (DMFT) and Oral Hygiene Index - Simplified (OHI - S) scores. Odds ratio was calculated with 95% confidence interval. $P \leq 0.05$ was considered statistically significant. Oral health had a significant association with school absenteeism and homework completion. School absenteeism was significantly associated with dental caries ($P = 0.007$) and poor oral hygiene ($P = 0.001$), whereas homework completion was significantly associated with dental caries alone ($P = 0.002$). There was no significant association between variables like self-esteem, first language, mathematics, and DMFT/OHI - S score.

Madhulika Yadav et al (2018)⁶² The main purpose of the present study was conducted to evaluate oral health status of school children & its association with parent's education level. A parent's educational level was classified as 'high' 'middle' and 'low' when they had attended only primary school or no education. Dental caries was assessed using dmft index; Oral hygiene status was evaluated using the Simplified Oral Hygiene Index (OHI-S) of

Greene and Vermillion. The oral hygiene of each child was classified as 'good' when the OHI-S score was 0–0.9, 'fair' when it was 1.0–1.9 and 'poor' when it was 2.0 up to 6. Age group 4-6 years had 24 boys, 26 girls, 7-9 years had 30 boys, 32 girls, 10-12 years had 26 boys, 22 girls and 13- 15 years had 40 boys and 36 girls. The difference was non- significant ($P > 0.05$). dmft score in age group 4-6 years was 1.42 ± 2.10 and in 7-9 years was 1.38 ± 2.64 . DMFT score in age group 10-12 years was 0.6 ± 1.16 and in 13-15 years was 0.8 ± 1.21 . OHI- S was good in 53% males and 66% females, fair in 24% males and 18% females and poor in 23% males and 16% females. The difference was significant ($P < 0.05$). Parent education level was high (34%), middle (21%) and low (45%). The difference was significant ($P < 0.05$).

Azadeh Babaei et al (2019)⁶³ Conducted a study to explore the oral health status of 6- to 7-year-old children based on the CAST index in relation to oral health knowledge and background determinants. The status of caries and oral hygiene was recorded according to the CAST index and OHI-Simplified (OHI-S) index, respectively. In permanent molars, a healthy status (code 0–2) was observed in 89.3–93.7% of the teeth. In primary molar teeth, dentinal lesions ranged from 25.3 to 31.2%, the prevalence of pulp involvement was between 2.9 and 10.5%, and less than 1% had abscess/fistula. Serious morbidity (codes 6 and 7) were more common in the first primary molars than the second ones. The consequences of dental caries including abscess and fistula were more prevalent in the first

and second primary teeth. There was a significant correlation between a CAST score of 3 and higher with father's education (as an indicator of social rank) and oral hygiene status. The CAST index is a useful and practical index in epidemiological surveys.

MATERIALS AND METHODS

The study protocol was assessed, analyzed and certified by Institutional Ethical Committee. An official permission was obtained from the school to conduct the study. A written prior consent was obtained from the parent to carry out the study. Sample size was calculated using G * Power statistical software.

Software: G Power 3.0.10

Analysis: A priori: Computed required sample size

Input:

Tail(s) = One

Effect size d = 0.46

α err prob = 0.05

Power (1- β err prob) = 0.80

Allocation ratio N2/N1 = 1

Output: Noncentrality parameter δ = 2.5195238

Critical t = 1.6578695

Df = 118

Sample size group 1 = 60

Sample size group 2 = 60

Total sample size = 120

A total of 120 students of both genders aged 8-10 years were examined. The experimental study was conducted over a period of 36 weeks and sample were randomly selected and allocated into 2 groups. Group I- without parents and Group II- with parents. All the records obtained from them were maintained confidential.

ARMAMENTARIUM:

Examination was carried out with the help of the following:

- Mouth Mirrors
- Tweezers
- No.23 explorer (shepherd's hook)
- Kidney Trays
- Cotton Holder
- Disposable Mouth mask
- Disposable Gloves
- Drape
- Surgical Spirit
- Hand Disinfectant
- Towel
- Liquid Soap

INCLUSION CRITERIA:

- 1) Male and female children of 8-10 years old
- 2) Good general health
- 3) Parents and children who are willing to give consent

EXCLUSION CRITERIA:

- 1) Children with chronic illness and prolonged medications
- 2) Children with orthodontic appliance
- 3) Those children with orofacial malformation
- 4) Children who have emergency dental treatment

METHODS:

A schedule for data collection was prepared. A total of 120 students of both genders aged 8-10 years were selected. The examination were carried out in the subject's own surroundings i.e. the school.

An organizing teacher at the examination site maintained a constant flow of subjects to the examiner and also entered general information on the survey form. A trained dental surgeon was involved to enter the codes on the survey form. The study was conducted over a period of 36 weeks and sample were randomly selected and randomly divided into 2 groups without and with parents. Both the groups, Group I and Group II included 60 subjects, 30 boys and 30 girls respectively, Group II also included 60 parents.

Before clinical examination a questionnaire was circulated among children to assess the knowledge regarding oral hygiene. The subjects were examined in the corridor of the school. The subjects were allowed to sit on a chair, where sufficient natural daylight was available. A table were arranged to place the instruments, tooth brush, tooth paste, pamphlets about tips of healthy teeth and brushing models. A recording person was allowed to sit close enough to the examiner so that instruction and scores could be easily heard and the examiner could see that findings were recorded correctly.

Oral examination was carried out using mouth mirror and explorer, under natural daylight. Dental caries assessment was done by the same person using DMFT and deft index. DMFT index was given by Henry T. Klein, Carrole E. Palmer and Knutson J.W in 1938 to determine the prevalence of coronal caries.⁶⁴ Individual DMFT is the total of each component D+M+F, deft index which was described by Gruebbel A.O in 1944 equivalent to DMF index for measuring dental caries in primary dentition.⁶⁵ Oral hygiene status was assessed by examining the presence of debris and calculus using Simplified Oral Hygiene Index (OHI-S) given by Greene and Vermillion in 1964.⁶⁶ Initial baseline data was collected using these indices. Dental health education was given using video, tooth models and pamphlets after the oral health examination. The children who required treatment were brought to the dental hospital and all their dental needs were treated. Dental examination was

carried out again using OHI-S, DMFT and deft index and health education was given at 3rd, 6th and 9th month interval for the same study group. Same questionnaire was circulated among children to assess the knowledge regarding oral hygiene at the end of the 9th month. Tooth brush, tooth paste were distributed to the children during the entire period of the study.

In OHI-S six teeth were used for scoring which included 16, 11, 26, 36, 31, and 46. In instances where not all the indicator teeth were present, scores from the primary teeth were obtained. Hence 55 was substituted for 16, 51 for 11, 65 for 26, 75 for 36, 71 for 31, and 85 for 46. If these teeth were not present then the next mesial tooth to the indicator tooth was used in the case of posterior teeth and the tooth of the opposite side in the same arch, in the case of anterior teeth. Buccal surfaces of the upper teeth and lingual surfaces of the lower teeth were checked for the presence or absence of calculus and debris. All the data were entered in the standard proforma. The results were statistically evaluated using Friedman's test.

METHOD:

Duration of the experimental study: 36 weeks



A total number of 120 children of age group 8-10 years old were randomly selected and subdivided into 2 groups.



Group I - without parents(60) Group II- with parents(60)
Both Group I and Group II included 30 boys and 30 girls.
In addition Group II included 60 parents



The pre assessment knowledge of oral hygiene practice was assessed at the start of the study using preformed questionnaire



Oral health examination was done using OHI-S, DMFT and deft indices. Initial baseline data was collected



Dental health education was given using video, tooth models and pamphlets.



Children who required treatment were brought to the dental hospital and all their dental needs were treated.



Oral health examination was conducted again using OHI-S, DMFT and deft indices and dental health education was given at 3rd, 6th and 9th month interval.



Tooth brush and tooth paste were distributed to the children during the entire period of the study.



Observation thus recorded was been subjected to statistical analysis using Friedman's test.



Figure 5: Conducting the examination



Figure 6: Conducting health education for Group II with parents



Figure 7: Treatment done

RESULTS

The present study evaluated the effectiveness of school dental health education program among school children of 8-10 years of age with and without parental guidance. 120 healthy school children were randomly selected. Selected children were divided into 2 groups. Group I without parents, Group II with parents of 60 (30 boys and 30 girls). The pre-assessment knowledge questionnaire was distributed to all the children before the start of the study. Oral health examination was done using DMFT, deft and OHI-S Indices. Initial baseline data was collected. Dental health education was given using video, tooth models and pamphlets after the oral health examination. The children who required treatment were brought to the dental hospital and all their dental needs were treated. Oral health status was evaluated again using DMFT, deft and OHI-S index and health education was given at 3rd, 6th and 9th month. The post assessment knowledge was assessed using same questionnaire.

The mean score for pre assessment knowledge and oral hygiene practice score of Group I and Group II were 6.50 ± 1.050 , 6.55 ± 1.268 (Mean \pm SD) respectively. The mean score for post assessment knowledge and oral hygiene practice score of Group I and Group II were 7.88 ± 0.761 , 8.03 ± 0.843 respectively. The assessment of knowledge and oral hygiene practice scores were not significantly different between the two groups (Table 1).

The mean DMFT score at the baseline of Group I was 0.27 ± 0.686 . At the end of 9th month it was about 0.57 ± 0.810 . There is a significant increase in the DMFT index over the study period from baseline to 9th month, $P < 0.001$ (Table 2).

The mean DMFT score at the baseline for Group II (with parents) was 0.25 ± 0.680 . At the end of 9th month it is about 0.30 ± 0.696 . There is a significant difference in mean DMFT scores within the group ($P = 0.029$). (Table 3).

The mean deft index score at the baseline of Group I without parents was 1.80 ± 2.114 . At the end of 9th month it was about 2.53 ± 2.054 . There is a significant increase in the deft index score over the study period $P < 0.001$ (Table 4)

The mean deft index at the baseline for Group II was 1.23 ± 1.430 . At the end of 9th month it was about 1.52 ± 1.513 . There was a significant increase in the deft index score over the time from 6th month onward, $P < 0.001$ (Table 5).

The mean OHI- S index score at the baseline for Group I was 1.265 ± 0.642 . At the end of 9th month it was about 1.082 ± 0.338 . There is a less significant reduction in the OHI-S index score over the time period $P < 0.001$ (Table 6).

The mean OHI-S index at the baseline of Group II with parents was 1.405 ± 0.635 . At the end of 9th month it was about 0.537 ± 0.370 . There is a significant reduction in the OHI-S index score over the time period $P < 0.001$ (Table 7)

The DMFT score at 6th and 9th month was significantly different between the two groups, owing to the increase in DMFT score in Group I (Without parents). In Group II (with parents), the DMFT score remained unchanged till 6th week, followed by a slight increase from 6th to 9th month. There was also a significant difference in OHI-S scores at 3rd, 6th and 9th months between the groups, owing to the constant increase in OHI-S score in group I. The test also showed a significant difference in deft index score at 6th and 9th months between the groups This proves the significance of the presence of parental guidance in the improvement of oral health status.(Table 8)

Descriptive statistics of the change in variables score from baseline to 9 months for DMFT, deft, and OHI-S index values was calculated accordingly and the difference was compared for significant difference between the groups, by Mann Whitney-U test. The test showed that there is a significant difference across all the parameters between the groups. The increment in carious lesions (increase in DMFT and deft scores) were higher in Group I (without parents) than in group II, and the reduction in OHI-S score was

significantly more in Group II (with parents). All these prove the positive influence of parental guidance in improvement of dental health status of the child.

TABLES AND GRAPHS

TABLE 1

Comparison of mean knowledge score among the groups of without parents (Group I) and with parents (Group II)

	Group	Mean	SD	SEM	Mean difference	95% CI of the Mean difference		P value
Age	Without Parents	8.75	0.571	0.074	0.067	-0.11	0.250	0.47
	With Parents	8.82	0.431	0.056				
Pre-assessment	Without Parents	6.50	1.050	0.136	0.814	-0.371	0.471	0.81
	With Parents	6.55	1.268	0.164				
Post-assessment	Without Parents	7.88	0.761	0.098	0.308	-0.14	0.44	0.30
	With Parents	8.03	0.843	0.109				

TABLE 2

Comparison of mean DMFT index score in Group I (without parents)

Without parents (Months)	Mean Rank	Mean	SD	P value
DMFT Baseline	2.21	0.27	0.686	<0.001
DMFT 3 rd month	2.31	0.32	0.725	
DMFT 6 th month	2.68	0.50	0.813	
DMFT 9 th month	2.81	0.57	0.810	

TABLE 3

Comparison of mean DMFT index score in Group II

(with parents)

With Parent (Months)	Mean Rank	Mean	SD	P value
DMFT Baseline	2.48	0.25	0.680	0.029
DMFT 3 rd month	2.48	0.25	0.680	
DMFT 6 th month	2.48	0.25	0.680	
DMFT 9 th month	2.58	0.30	0.696	

TABLE 4

Comparison of mean deft index score in Group I

(without parents)

Without parents (Months)	Mean Rank	Mean	SD	P value
deft Baseline	1.71	1.80	2.114	<0.001
deft 3 rd month	2.03	1.97	2.147	
deft 6 th month	3.12	2.52	2.071	
deft 9 th month	3.15	2.53	2.054	

TABLE 5

Comparison of mean deft index score in Group II

(with parents)

With Parents (Months)	Mean Rank	Mean	SD	P value
deft baseline	2.26	1.23	1.430	<0.001
deft 3 rd month	2.26	1.23	1.430	
deft 6 th month	2.68	1.45	1.443	
deft 9 th month	2.80	1.52	1.513	

TABLE 6

Comparison of mean OHI-S index score in Group I

(without parents)

Without parents (Months)	Mean Rank	Mean	SD	P value
OHI-S baseline	3.34	1.265	0.642	<0.001
OHI-S 3 rd month	1.28	0.658	0.328	
OHI-S 6 th month	2.41	0.972	0.341	
OHI-S 9 th month	2.98	1.082	0.338	

TABLE 7

Comparison of mean OHI-S index score in Group II
(with parents)

With Parents (Months)	Mean Rank	Mean	SD	P value
OHI-S baseline	3.93	1.405	0.635	<0.001
OHI-S 3 rd month	1.57	0.408	0.304	
OHI-S 6 th month	2.18	0.517	0.338	
OHI-S 9 th month	2.33	0.537	0.370	

TABLE 8

Comparison of mean score of DMFT, deft and OHI-S index
among both the groups without parents (Group I) and
with parents (Group II)

Variables (Months)	Without parents		With Parents		'z' statistic	P value
	Mean	SD	Mean	SD		
DMFT baseline	0.27	0.686	0.25	0.680	-0.23	0.815
DMFT 3 rd month	0.32	0.725	0.25	0.680	-0.69	0.485
DMFT 6 th month	0.50	0.813	0.25	0.680	-0.24	0.013
DMFT 9 th month	0.57	0.810	0.30	0.696	-3.10	0.002
deft baseline	1.80	2.114	1.23	1.430	-1.24	0.213
deft 3 rd month	1.97	2.147	1.23	1.430	-1.85	0.064
deft 6 th month	2.52	2.071	1.45	1.443	-2.96	0.003
deft 9 th month	2.53	2.054	1.52	1.513	-2.85	0.004
OHI-S baseline	1.265	0.642	1.405	0.635	-0.38	0.700
OHI-S 3 rd month	0.658	0.328	0.408	0.304	-4.06	<0.001
OHI-S 6 th month	0.972	0.341	0.517	0.338	-6.27	<0.001
OHI-S 9 th month	1.082	0.338	0.537	0.370	-6.89	<0.001

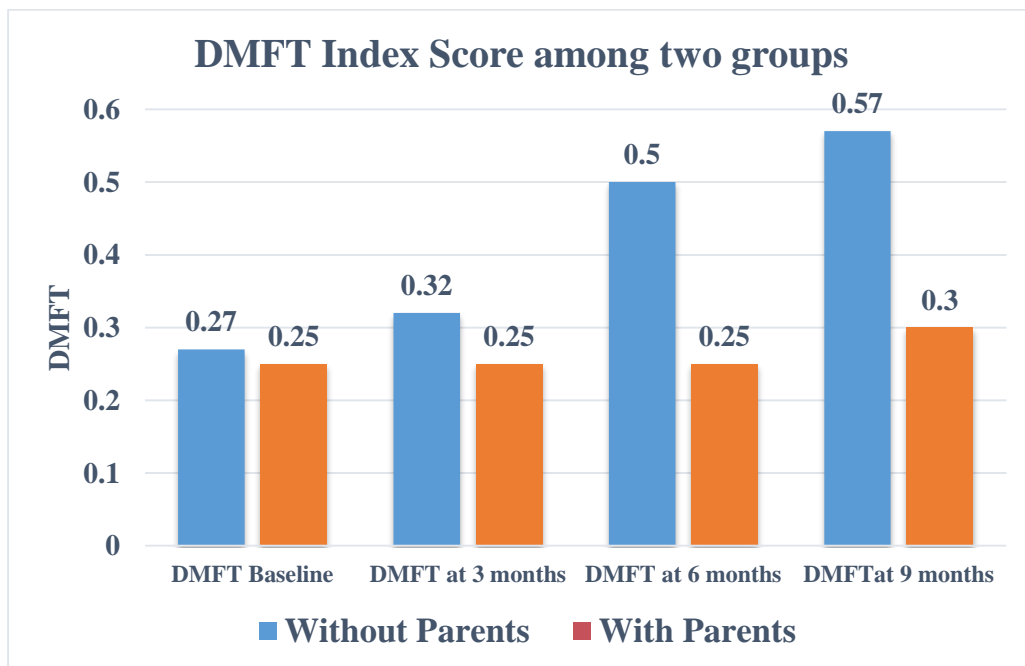
TABLE 9

Descriptive statistics change in variables score from baseline to 9 months among both the Group without parents (Group I) and with parents (Group II)

Variables (Months)	Without Parents		With Parents		'z' statistic	P value
	Mean	SD	Mean	SD		
DMFT (baseline-9 th month)	.30	.462	0.05	0.219	-4.58	<0.001
deft (baseline-9 th month)	.73	.482	.28	.490	-4.71	<0.001
OHI-S (baseline -9 th month)	.18	.488	.868	.508	-6.53	<0.001

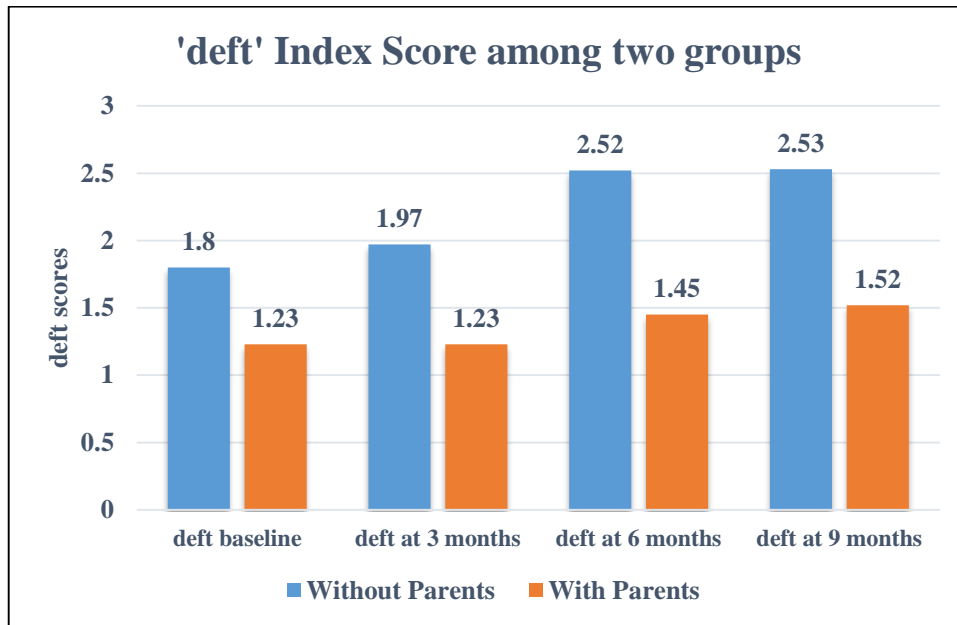
GRAPH 1

Comparison of mean DMFT index scores at baseline, 3rd month, 6th month and 9th month among two Groups without parents (Group I) and with parents (Group II)



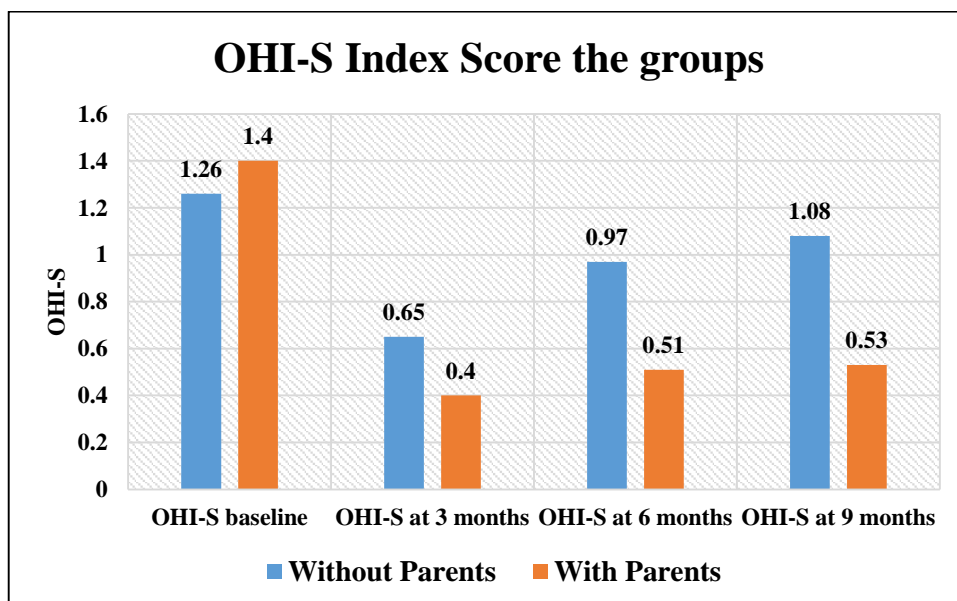
GRAPH 2

Comparison of mean deft index scores at baseline, 3rd month, 6th month and 9th month among two Groups without parents (Group I) and with parents (Group II)



GRAPH 3

Comparison of mean OHI-S index scores at baseline, 3rd month, 6th month and 9th month among two Groups without parents (Group I) and with parents (Group II)



DISCUSSION

Oral diseases are one of the most commonly and extensively affecting disease of mankind regardless of age, sex, location or employment of an individual. Though there has been considerable improvement in oral health of children in last few decades, dental caries still remain one of the most commonly occurring oral health problems in the children all over the globe. Dental caries has significant impact on general health, social and economic well-being of the children. Modern Dentistry has been developing new concepts on early care and on oral health maintenance, contributing to the decrease in the prevalence of dental caries.

In every community and country, children are the backbone of a nation and development of any nation depends on the health and well-being of its child population. Health is a common perspective in most cultures and it is fundamental to humans without any distinction of race, religion and political belief, economic and social condition. Health is a critical aspect of human well-being and flourishing. Oral health is an integral component of health without oral health, one is not healthy.

Good health is essential for learning and for the cognitive ability of the child. Good oral health practices are necessary from a young age to ensure positive long term oral health and hygiene. By

ensuring good health children of school age can boost attendance and educational achievement. WHO has recommended oral health promotion through school for improving knowledge, attitude and behaviour related to oral health and for the prevention and control of oral disease among school children.⁶⁷ Thus; new concepts were developed based on the principle that education generates healthy lifestyle habits.

Knowledge, attitude and behaviours of children towards sustainable good oral health depend upon an integrated health education and health promotion approach. A well designed dental health curriculum which is based on cognitive and behavioural objectives can result in better related skill performance as well as high cognitive performance.

Across the world, the school is considered as an important platform for oral health promotion and disease prevention, as they reach over a billion children worldwide. Oral health promotion messages can be imparted as well as reinforced throughout the most influential stages of a child's lives, enabling a school-going child to develop lifelong sustainable attitudes and skills at schools. Those who suffer poor health cannot actively participate in school activities. Healthy children, on the other hand will attend school more regularly and can benefit fully. School life are the formative

years of a child transforming mentally and physically and also transforming him into a promising adult.

Primary schools have great potential for influencing oral health behaviours because children spend considerable time in school and can be educated while their habits are developing. Especially for children, school based health programs are the most common, since such program can benefit a wide group of children with extremely low cost.⁶⁸ Mc Donald and Avery pointed out that although most schools encourage health programs, very few provide the proper value to oral health education interventions.

According to Kay & Locker, health education is helpful in raising the level of knowledge, and in changing both attitudes and beliefs.⁶⁹ Health education is an important tool in educating school children about the prevention of oral health related problems. Well planned and executed health education and promotion programs, starting at the earliest school grades could lead to a considerable decline in the oral health problems of the school children. Education is a threefold process of imparting knowledge, developing skills and interests, attitudes and life values. Kay E and Locker also reported that oral health education has a positive impact in lowering plaque and gingivitis scores in oral health education programs.

The role of education, particularly the early education is imperative, since it is easier to shape the behaviour of individuals when they are relatively at a young age. They easily pick up knowledge, habits and skills. Health promotion programs provide not only school children, but also their parents, with adequate information on dental care involving oral health habits and attitudes.

The council on Dental Health of the American Dental Association has adopted the principle that “dental care is the responsibility of the individual, the family, and the community in that order.” Schools remain an important setting, offering an efficient and effective way to reach many children and through them, families, and community members. Health-influencing factors are addressed at individual, family, and community levels. In fact, simple models based on each individual are limited and no longer acceptable. Children live in families; families are included in communities. Therefore, effective community initiatives, such as oral health promotion and public approaches are related to children’s oral health. Communities that value oral health lead to children with better oral health.⁷⁰

Oral health is correlated with general health. The mouth is part of the body and a child’s risk of developing oral diseases is as high as his/her risk of developing overall illnesses. Similarly, it is

impossible to separate the family's and society's risks for disease from the child's risk for the development of both general and oral pathologies. Consequently, any approach to children's oral health must be based on a multilevel outlook as a means to achieve long-term effects.⁷¹

Clearly, family environments encourage healthy choices and lifestyles. Ideally, dental professionals should inform parents of the influence that their dental health behaviours and attitudes might have on their children's oral health, including the benefits of pediatric oral care, oral health educational programs, and other dental-health-related issues.⁷²

Awakening the interest of the family to care for the health of its members and educating them to adopt an appropriate lifestyle have a great impact on their lives, promoting good general and oral health. When mother participate in an oral health care program, they become well-informed and are motivated to adopt healthy habits, a fact that contributes to the reduction in caries incidence.⁷³ Behavioural habits in childhood begins at home from their parents, especially the mother plays an important role in the child's oral health-behaviours. Sarnat et al reported that, more positive the mother's attitude regarding her child, the fewer caries the child had, the better the child's oral hygiene, and the more dental treatment the child received.⁷⁴ Parents should be educated that their dental

health habits will have influence on their children's oral health, consequently their quality of life. Therefore, a more soundly based health educational program should be given with parent's providing adequate guidance on how to maintain the oral health of their children.

Coordinating school dental health education with parents ensures long term benefits. Active involvement is the key to effective learning and classroom based oral health education, as well as regular group meetings with parents are recommended. The entire family should be responsible for their dental hygiene. The establishment of systematic oral health care programs for children is urgently needed and school may serve as ideal place for promotion of oral health habits in children and parents.⁷⁵

Children oral health depends on the quality and access of mothers to educational and preventive measures, as well as on the constant reinforcement of the knowledge acquired.⁶ The success of programs promoting oral health in the schools depends largely on reinforcement at home, especially by the parents.⁷⁶ Nobody else can understand the requirement of children more than parents. Parents perform a central role in the transference of information related to the health and to the healthy behaviour of their children.

Furthermore, mothers are considered as models to be followed because they transfer the values, norms and attitudes that are accepted for their children. Parents can provide best dental health care for children if they are well aware of dental diseases. Parent's attitudes have a positive impact on the state of children's oral health; because the parents control tooth brushing and sugar consumption, the children develop positive oral health habits.⁷⁷

The present study was conducted to evaluate oral health status in school children of 8-10 years old. The study was conducted over a period of 36 weeks and sample were randomly selected and divided into 2 groups without and with parents Group I and Group II respectively. Each group of Group I and Group II consists of 30 boys and 30 girls respectively and group II in addition including 60 parents.

In the present study questionnaire was circulated at the baseline and end of the study. Questionnaire was used to find the oral hygiene practices and visit to a dentist. Since the analysis of the questionnaire reveals their poor dental attendance and inadequate oral hygiene habits. The oral health education emphasizing on proper method of tooth brushing, the importance of oral hygiene and regular dental check-up was provided. The assessment scores were not significantly different between the two groups.

In the present study the level of dental caries was measured using deft and DMFT index for both primary and permanent dentition respectively. DMFT index was given by Henry T. Klein, Carole E. Palmer and Knutson J.W in 1938 to determine the prevalence of coronal caries.⁶⁴ Individual DMFT is the total of each component D+M+F, deft index which was described by Gruebbel A.O in 1944 equivalent to DMF index for measuring dental caries in primary dentition.⁶⁵

Oral hygiene status was assessed by examining the presence of debris and calculus using Simplified Oral Hygiene Index given by Greene and Vermillion in 1964 for mixed dentition.⁶⁶

In present study the mean score of Simplified Oral Hygiene Index, deft, DMFT score was higher in group of without parents when compared to with parents, which was statistically significant. These findings suggested that a negative association exist in the group without parents and poor oral hygiene status of the children.

These findings obtained in the present study was similar to that of Jalevik et al in 1999 who reported that lack of parent's regular dental attendance might be reflected in their children. Lack of parent's interest to visit dentist might also contribute to the irregular dental attendance. Dental attitudes displayed by parents might also offer an explanation of the lack of regular attendance.⁷⁸

The presence of dental problems in parents may follow by some problems such as poor hygiene (high-plaque index) in their children. Sometimes dental problems in parents also affect their consideration to hygienic behaviours of their child.

Studies have reported that poor attitude of parents toward oral health of infants and young children are associated with increased caries prevalence.⁷⁹ Similarly, Bridge et al. found that low parent's educational attainment and low family income were associated with high children's dental caries status.⁸⁰ Studies have reported that poor attitude of parents toward oral health of infants and young children are associated with increased caries prevalence.⁷⁹

In the present study there is positive association exist in group including parents and oral hygiene status of the children. John Lee reported that the children with parental attendance showed significantly greater improvement of oral health.¹² Mother's dental visit may also influence their children's dental health and attendance, such relation was reported in various countries (Petersen et al., 1995).⁸¹ This improved oral health status would be expected due to the significantly improved oral health behaviour that was evidence by the group with parental attendance.

There is always significant relationship between the education of mothers and plaque index of children. It is suggested that

educating mothers can increase their knowledge about health behaviour and also increases their ability to supervise hygienic practices of their children. Previous studies results also suggest that parents with higher education have more positive and stronger intentions to control children's health behaviour than low-educated parents.⁸² In a study by Abiola Adeniyi et al., a significant relationship was reported between mother's educational level and the oral hygiene status of their children.⁸³ It has been found more positive is the parent's attitudes towards dentistry; the better will be the dental health of their children.⁸⁴

SUMMARY

Good oral health in children is important to meet their general health needs. Oral health plays a key role in maintaining the overall health status and quality of life in children. Dental caries and gingival disease are the two foremost oral pathologies that remain widely prevalent in children. Consequences of dental diseases in children may result in impairments of daily life activities. Oral health is now considered as equally important in relation to general health. It is always crucial to have good oral health for all children's to obtain their optimum success in school and in life.

Schools are ideal settings for providing students with good oral health knowledge, skills and along with other health practices. The goal of oral health education is to educate, which may lead to adoption of favourable oral health behaviours which contributes in better oral health. Education goes beyond enriching knowledge and developing life-skills in students. It was suggested that the sooner oral health related behaviours initiated in the life, there is higher probability for successful long term maintenance.

The oral diseases are preventable in their early stages, but unfortunately, the knowledge that these diseases can be prevented by simple self-controlled oral hygiene procedures is not known to many of the children, their parents, teachers as well as the

policymakers. Including parents in school dental health education program have a positive impact on the state of children's oral health. It is also about parents have important role in oral health, because they are the main caregivers of oral health to their children.

Hence the present study was carried out to evaluate the effectiveness of school dental health education program conducted at regular intervals for school children with and without parental guidance.

The present study was carried out among 120 school students aged 8-10 years old of both the genders. The study was conducted over a period of 36 weeks and sample were randomly selected and allocated into 2 groups without and with parents Group I and Group II. Further each group includes 30 boys and 30 girls respectively with addition of 60 parents in Group II.

Knowledge regarding oral hygiene practices and visit to the dentist was assessed. Questionnaire was circulated at the baseline and end of the study. Children in both the groups had similar knowledge. The assessment scores were not significantly different between the two groups. Oral health examination was done using DMFT, deft and OHI-S Indices. Initial baseline data was collected. Dental health education was given using video, tooth models and pamphlets after the oral health examination. The children who

required treatment were brought to the dental hospital and all their dental needs were treated. Tooth brush, tooth paste was given during the entire period of the study.

The oral hygiene status of all the children was assessed again using DMFT, deft and OHI-S index and dental health education is also given at 3rd, 6th and 9th month. The result showed among the total 120 sample, the mean DMFT, deft and OHI-S index score was increased in both the groups. Even though this association was statistically significant in both the groups, the group without parental presence was showing higher significance. In the present study a positive association exists in group including parents and oral hygiene status of the children

The present study supported that including parent's in school dental health education has got a better influence on oral hygiene status of the children. Therefore including parents in school dental health education program should be considered important. Parents, who actively participated in school dental health education program, have received information on appropriate oral health care. These parents will make efforts to acquire good oral hygiene habits for their children. Therefore, there is a need to initiate more dental awareness programs including parents to enhance the quality of oral health in the children.

CONCLUSION

The present study was carried out to evaluate the effectiveness of school dental health education program conducted at regular intervals for 8-10 years old school children with and without parental guidance.

The key findings of the study are enumerated below:

The mean score for pre assessment knowledge and oral hygiene practice score of Group I and Group II were 6.50 ± 1.050 , 6.55 ± 1.268 respectively. The mean score for post assessment knowledge and oral hygiene practice score of Group I and Group II were 7.88 ± 0.761 , 8.03 ± 0.0843 respectively. In this study the assessment of knowledge and oral hygiene practice scores were not significantly different between the two groups without and with parents.

At the baseline the mean score for DMFT, deft, OHI-S score of Group I and Group II were 0.27 ± 0.686 and 0.25 ± 0.680 , 1.80 ± 2.114 and 1.23 ± 1.430 , 1.265 ± 0.642 and 1.405 ± 0.635 respectively. At the end of 9th month mean score for DMFT, deft and OHI-S index for Group I and Group II were 0.57 ± 0.81 and 0.30 ± 0.69 , 2.53 ± 2.054 and 1.52 ± 1.513 , 1.082 ± 0.338 and 0.537 ± 0.370 respectively. A positive association exists in group including parents and oral hygiene status of the children. Even

though this association was statistically significant in both the groups, the group without parental presence was showing higher significance due to increase in caries in children and poor oral hygiene status of the children.

This study showed that a school based oral health education program had a positive effect on the student's oral health and knowledge. The benefits of such programs can be expanded with continuous school-based oral health programs involving school personals and parents. Organizing oral health education including parents could lead to greater improvement in children's oral hygiene ultimately enhancing their oral health compared to imparting oral health education without parental presence.

Parent's participation in dental health education has led to highly significant increase of oral hygiene status of children. The obtained results supported that role of parents in dental health education will enhance the quality of oral health in children. Therefore, a more soundly based health educational program should be given with parents, providing adequate guidance on how to maintain the oral health of their children. Mothers who received information on appropriate oral health care will acquire good oral hygiene habits for their children. Therefore, there is a need to initiate more dental awareness programs for parents and their children to assess as well as to spread dental health awareness in the Indian society.

India as a developing country faces many challenges in delivering oral health needs. The following are future recommendations for structuring school dental health program in India. Which includes the government should incorporate oral and dental health related topic in School curriculum. Parent's participation in school dental health education should be mandatory. Dental Surgeons play a very important role in recognizing child abuse in school environment. The straight path to accomplish the above goals is achieved through strong support from policy makers and professional support from dental surgeons working in public and private sector in India.

The obtained results supported that including parent's in school dental health education increases the final result of the program, therefore including parents should be considered important in imparting school dental health education programs in a better way.

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ANNEXURE I

PARTICIPATION INFORMATION SHEET (ENGLISH)

PARTICIPATION - INFORMATION SHEET (PIS)

Principal Investigator: Dr. R. A. Sowmiya Sree

Contact No : 9788353525

The Research topic is Comparative Evaluation of Effectiveness of School Dental Health Education Program among School Children of 8-10 Years old with and without Parental Guidance. The aim of this study is to determine if parental presence has any influence on school dental education program. In this study, in initial visit, oral hygiene status will be recorded and cleaning of teeth will be done. School Dental health education will be given at 0, 3rd and 6th month, in the form of videos, teeth models and pamphlets containing oral hygiene instructions to the child and the parent. Later the oral hygiene of the child is evaluated at the end of 3, 6, and 9 months. Any dental treatment required for the children participating in this study will be given cost of free. There is no risk or harm to the child and child's records will be confidential. The child will be provided with freedom to either participate or to withdraw from research at any time without any penalty.

Signature of the patient

ANNEXURE II

PARTICIPANT INFORMATION SHEET (TAMIL)

நோயாளியின் தகவல் படிவம்

ஆராய்ச்சியாளரின் பெயர்: ரா. அ. ரெனடியாபதி
கைப்பேசி எண்: 9788353525

தலைப்பு: பள்ளி பல் சுகாதார கல்வி திட்டத்தின் திறனை 8-10 வயது குழந்தைகளில் பெற்றோர் வழி காட்டுதலும், இல்லாமலும் ஒப்பிட்டு மதிப்பிடுதல்.

இந்த ஆராய்ச்சியின் நோக்கம் பெற்றோர் உடனிருப்பு பள்ளி கல்வி திட்டத்தில் ஏதேனும் மாற்றம் ஏற்படுத்துகின்றதா என்பதே.

இந்த ஆய்வில் முதல் நேர்காணலில் வாய் சுகாதார நிலை பதிவு செய்யப்படும் மற்றும் பற்கள் சுத்தம் செய்யப்படும். பள்ளி பல் சுகாதார ஆலோசனை 0, 3, 6 மாதங்களில் காணொலி மற்றும் பற்கள் மாதிரிகள், துண்டு பிரசுரங்கள் மூலமாக குழந்தைகளுக்கும், பெற்றோர்களுக்கும் வழங்கப்படும். பின்பு குழந்தைகளின் வாய் சுகாதாரம் 3, 6, 9 மாதங்களில் மதிப்பீடு செய்யப்படும். இந்த ஆய்வில் கலந்து கொள்ளும் குழந்தைகளுக்கு ஏதேனும் மருத்துவம் தேவைப்பட்டால் இலவசமாக வழங்கப்படும். இந்த ஆய்வில் பங்கேற்கும் குழந்தைகளுக்கு எவ்வித ஆபத்தும், தீங்கோ உண்டாகாது. குழந்தைகளின் பதிவுகள் ரகசியமாக வைக்கப்படும். இவ்வராய்ச்சியிலிருந்து எப்போது வேண்டுமானாலும் விலகிக் கொள்ளலாம் என்றும் அவ்வாறு விலகும் போது அது எவ்விதத்திலும் பாதிக்காது என்றும் உறுதி கூறுகிறேன்.

இந்த தகவல்களின் உள்ளடக்கங்களை நான் கவனமாக படித்தேன். அது என்னுடைய மொழியில் எனக்கு விளக்கப்பட்டது. நான் அவற்றை முழுமையாக புரிந்து கொண்டேன். எனக்கு ஏற்பட்ட சந்தேகங்களை தீர்த்துக் கொள்ள வாய்ப்பு அளிக்கப்பட்டது என்பதை உறுதி படுத்துகிறேன். எனவே நான் இந்த ஆராய்ச்சியில் பங்கேற்பதற்கு முழுமனதுடன் சம்மதிக்கின்றேன்.

நோயாளியின் கையொப்பம்

ANNEXURE - III

PARTICIPANT INFORMED CONSENT FORM (PICF) - ENGLISH

IHEC Proposal S.No: _____ Date: _____

Title of the project: **Comparative Evaluation of Effectiveness of School Dental Health Education Program among School Children of 8-10 Years Old with and without Parental Guidance**

Name of the Principal Investigator: **Dr. R. A SOWMIYA SREE** Mobile No.**9788353525**

The contents of the information sheet dated _____ that was provided have been read carefully by me / explained in detail to me, in a language that I comprehend, and I have fully understood the contents. I confirm that I have had the opportunity to ask questions.

The nature and purpose of the study and its potential risks / benefits and expected duration of the study, and other relevant details of the study have been explained to me in detail. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my child medical care or legal right being affected.

I understand that the information collected about my child from participation in this research and sections of any o medical notes may be looked at by responsible individuals from care. I give permission for these individuals to have access to my records.

I agree to take part in the above study.

Date:
Place: Chennai

(Signatures /Left Thumb Impression)

Name of the Participant:
Son / **Daughter** / Spouse of:
Complete Postal Address:

This is to certify that the above consent has been obtained in my presence.

Date:
Place: **CHENNAI**

Signature of the principal Investigator

1. Witness - 1

2. Witness - 2

Signature
Name & Address

Signature
Name & Address

ANNEXURE - IV

PARTICIPANT INFORMED CONSENT FORM (PICF) - TAMIL

ஒப்புதல் படிவம்

நான்.

தலைப்பு. பள்ளி பல் சுகாதார திட்டத்தின் திறனை 8 – 10 வயது குழந்தைகளில் பெற்றோர் வழிகாட்டுதலுடனும் இல்லாமலும் ஒப்பீட்டு மதிப்பீடுதல்.

முதன்மை ஆய்வாளரின் பெயர். ரா. அ. சிசுமியா பதி

கைப்பேசி எண். 9788353525

இத்தகவல்களின் உள்ளடக்கங்களை நான் கவனமாக படித்தேன். அது என்னுடைய மொழியில் எனக்கு விளக்கப்பட்டது. நான் அவற்றை முழுமையாக புரிந்து கொண்டேன். எனக்கு ஏற்பட்ட சந்தேகங்களை தீர்த்துக் கொள்ள வாய்ப்பு அளிக்கப்பட்டது என்பதை உறுதி படுத்துகிறேன்.

இந்த ஆராய்ச்சியின் முடிவில் என்னுடைய பெயர் மற்றும் என்னை பற்றிய தகவல்கள் வெளியே வராது என்பதையும், நான் விரும்பும் பட்சத்தில் இந்த ஆராய்ச்சியிலிருந்து எப்போது வேண்டுமானாலும் விலகிக் கொள்ளலாம் என்றும் அவ்வாறு விலகும் போது அது எனது குழந்தைக்கு அளிக்கப்படும் சிகிச்சையை ஒருபொழுதும் பாதிக்காது என்றும் அறிந்து கொண்டேன்.

இந்த ஆராய்ச்சியில் பங்கேற்க முழுமனதாக நான் சம்மதிக்கிறேன்.

நோயாளியின் கையொப்பம் / இடது பெருவிரல் ரேகை

ஆராய்ச்சியாளரின் கையொப்பம்.

பங்கேற்பவரின் பெயர்.

பங்கேற்பவரின் முகவரி.

சாட்சி (1)

பெயர்.

முகவரி.

கையொப்பம்

சாட்சி(2)

பெயர்.

முகவரி.

கையொப்பம்

ANNEXURE - V

Consent form (for participants less than 18 years of age)

Parent/ Legally accepted representative (LAR) - ENGLISH

Participant's name:

Address:

Parent/LAR's name:

Title of the project: Comparative Evaluation of Effectiveness of School Dental Health Education Program among School Children of 8- 10 Years old with Without Parental Guidance

The details of the study have been provided to me in writing and explained to me in my own language. I confirm that I have understood the above study and had the opportunity to ask questions. I understand that my child's/ward's teeth can be used in the study is voluntary and that I am free to withdraw my child/ward at any time, without giving any reason, without the medical care that will normally be provided by the hospital being affected. I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s). I have been given an information sheet giving details of the study. I fully consent for the participation of my child/ward in the above study.

Assent of child/ward obtained (for participants 7 to 18 years of age)

Signature of parent/LAR: _____ Date: _____

Signature of the Witness: _____ Date: _____

Signature of the investigator: _____ Date: _____

ANNEXURE - VI

Consent form (for participants less than 18 years of age)

Parent/ Legally accepted representative (LAR) – TAMIL

ஒப்புதல் படிவம் / 18 வயதிட்கும் குறைவான பங்கேற்பாளர்களுக்கு

பெற்றோர் / சட்ட பூர்வமாக ஏற்றுக் கொள்ளப்பட்ட பிரதிநிதி

குழந்தையின் பெயர்:

பெற்றோர் பெயர்:

முகவரி.

ஆய்வின் தலைப்பு. பள்ளி பல் கல்வி சுகாதார திட்டத்தின் திறனை 8 – 10 வயது குழந்தைகளில் பெற்றோர் வழிகாட்டுதலுடனும், இல்லாமலும் ஒப்பிட்டு மதிப்பிடுதல்.

இந்த ஆய்வின் விவரங்களை எனக்கு எழுதப்பட்ட வடிவத்தில் வழங்கப்பட்டு, எனது சொந்த மொழியில் விளக்கப்பட்டது. மேலே குறிப்பிடப்பட்ட ஆய்வினை புரிந்து கொண்டு மற்றும் அது சம்பந்தமான கேள்விகள் கேட்கவும் வாய்ப்பு கிடைத்தது என்று உறுதி படுத்துகிறேன். இந்த ஆய்வில் எனது குழந்தை பங்களிப்பது தன்னார்வமிக்கது என்பதை புரிந்து கொள்கிறேன். என் குழந்தையை எந்த நேரத்திலும் இந்த ஆய்வில் பங்களிப்பதை நிறுத்திக் கொள்ள எனக்கு அதிகாரம் உண்டு என்பதையும், இதனால் எனது குழந்தைக்கு அளிக்கப்படும் பல் மருத்துவ சிகிச்சை பாதிக்கப்படாது என்பதை நான் அறிவேன். இந்த ஆய்வின் முடிவுகளை அறிவியல் நோக்கத்திற்காக பயன் படுத்துவதை கட்டுப்படுத்த மாட்டேன் என்பதை ஒப்புக் கொள்கிறேன். இந்த ஆய்வின் தகவல்கள் அடங்கிய தாள் எனக்கு வழங்கப் பட்டுள்ளது. நான், எனது குழந்தை இந்த ஆய்வில் பங்கேற்பதற்கு முழுமையாக ஒப்புதல் அளிக்கிறேன்.

குழந்தையின் ஒப்புதல் பெறப்பட்டது.

பெற்றோர்/ சட்ட பூர்வமாக ஏற்றுக் கொள்ளப்பட்ட பிரதிநிதி கையொப்பம்.

நாள்.

சாட்சியாளர் கையொப்பம்.

நாள்.

ஆராய்ச்சியாளர் கையொப்பம்.

நாள்.

ANNEXURE –VII

QUESTIONNAIRE TO EVALUATE THE ASSESSMENT OF
ORAL HYGIENE PRACTICE

- 1) How do you clean your teeth?
 - a) Tooth brush and tooth paste
 - b) Tooth brush and tooth powder
 - c) Finger and tooth powder
 - d) Neem sticks
 - e) Any other specify
- 2) How often you clean your teeth?
 - a) Once daily
 - b) Twice daily
 - c) More than twice daily
 - d) After every meal
- 3) How do you brush your teeth?
 - a) Use horizontal strokes
 - b) Use vertical strokes
 - c) Both horizontal and vertical strokes
 - d) Circular strokes
- 4) How often you change your brush?
 - a) Once in 3 months
 - b) Once in 6 months
 - c) Yearly once
 - d) When bristles get frayed up
 - e) Don't know exactly
- 5) What amount of paste you will apply on your brush?
 - a) Full length of bristles
 - b) Half length of bristles
 - c) Pea sized amount

- 6) Do you rinse your mouth after meals?
- a) Yes
 - b) No
 - c) Sometimes
- 7) Do you clean your tongue?
- a) Yes
 - b) No
- 8) How do you clean your tongue?
- a) Tongue cleaner
 - b) Fingers
 - c) Tooth brush
 - d) Any other specify
- 9) Have you ever used dental floss?
- a) Yes
 - b) No
- 10) How often do you visit the dentist?
- a) Once in 3 months
 - b) Once in 6 months
 - c) Once in a year
 - d) Never visited

ANNEXURE – VIII

**QUESTIONNAIRE TO EVALUATE THE ASSESSMENT OF
ORAL HYGIENE PRACTICE (TAMIL)**

வாய் வழி சுகாதார பயிற்சி மதிப்பிடுதல்

1. நீங்கள் எப்படி உங்கள் பற்களை சுத்தம் செய்கிறீர்கள் ?
 - அ) ப்ரஷ் மற்றும் பற்பசை
 - ஆ) கைவிரல் மற்றும் பற்பொடி
 - இ) ப்ரஷ் மற்றும் பற்பொடி
 - ஈ) வேப்பங்குச்சி
 - உ) மற்றவை
2. நீங்கள் எவ்வளவு முறை பற்களை சுத்தம் செய்கிறீர்கள் ?
 - அ) நாளுக்கு ஒரு முறை
 - ஆ) நாளுக்கு இரு முறை
 - இ) நாளுக்கு மூன்று முறை
 - ஈ) ஒவ்வொரு முறையும் உணவிற்கு பிறகு
3. நீங்கள் எப்படி பற்களை துலக்குவீர்கள் ?
 - அ) பற்களின் வலது, இடது புறமாக
 - ஆ) பற்களின் மேல் இருந்து கீழ் வசமாக
 - இ) மேற்கூறப்பட்ட இருவகையிலும்
 - ஈ) வட்டம், வட்டமாக
4. நீங்கள் எவ்வளவு நாளுக்கு ஒரு முறை ப்ரஷ்-ஐ மாற்றுவீர்கள் ?
 - அ) மூன்று மாதத்திற்கு ஒரு முறை
 - ஆ) ஆறு மாதத்திற்கு ஒரு முறை
 - இ) வருடத்திற்கு ஒரு முறை
 - ஈ) ப்ரஷின் நுனி விரிந்து போகும்போது
 - உ) சரியாக தெரியவில்லை.

5. உங்கள் ப்ரஷின் மேல் எவ்வளவு பற்பசையை பயன் படுத்துவீர்கள் ?
- அ) ப்ரஷ் முழு அளவிற்கும்
ஆ) ப்ரஷ் பாதி அளவிற்கும்
இ) பட்டாணி அளவிற்கு
6. உணவு உண்ட பின் வாயை கொப்பளிப்பீர்களா ?
- அ) ஆமாம்
ஆ) இல்லை
7. நாக்கினை சுத்தம் செய்வீர்களா ?
- அ) ஆமாம்
ஆ) இல்லை
8. நாக்கினை எப்படி சுத்தம் செய்வீர்கள் ?
- அ) நாக்கு வழிப்பான்
ஆ) விரல்
இ) ப்ரஷ்
ஈ) மற்றவை
9. பல் மருத்துவரை எவ்வளவு நாளுக்கு ஒரு முறை அணுகுவீர்கள் ?
- அ) மூன்று மாதத்திற்கு ஒரு முறை
ஆ) ஆறு மாதத்திற்கு ஒரு முறை
இ) பல் வலி வரும்போது
ஈ) இதுவரை அணுகியதில்லை
10. பற்களுக்கிடையே சுத்தம் செய்யும் நூலை பயன்படுத்தி இருக்கிறீர்களா ?
- அ) ஆமாம்
ஆ) இல்லை

ANNEXURE -IX
EXAMINATION FORM

CHILD NAME:

DATE:

AGE/SEX:

OP NO:

PARENT'S NAME:

ADDRESS:

CHIEF COMPLAINT:

HISTORY OF PRESENTING ILLNESS:

PAST MEDICAL HISTORY:

PAST DENTAL HISTORY:

PERSONAL HISTORY:

BASELINE CLINICAL EXAMINATION:

ORAL HYGIENE INDEX SIMPLIFIED OHI-S: JOHN C. GREENE AND JACK R. VERMILLION- 1964

DEBRIS INDEX SCORE:

16	11	26
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
46	31	36

SCORE:

Good / Fair /Poor

CALCULUS INDEX SCORE:

16	11	26
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
46	31	36

SCORE:

Good / Fair /Poor

OHI-S= DI-S + CI-S

CALCULATION:

$$\text{Calculation of DI-S Score} = \frac{\text{Total score}}{\text{No of surfaces examined}}$$

$$\text{Calculation of CI-S Score} = \frac{\text{Total score}}{\text{No of surfaces examined}}$$

INTERPRETATION

deft index:

It was described by Gruebbel A.O in 1944 equivalent to DMF index for measuring dental caries in primary teeth.

PRIMARY DENTITION:

55	54	53	52	51	61	62	63	64	65

85	84	83	82	81	71	72	73	74	75

dt = **et** = **ft**=

deft score =

PERMANENT DENTITION:

DMFT SCORE

It was developed by Henry T.klein ,Carrole E. Palmer and Knutson J.W in 1938 to determine coronal caries

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

17 16 15 14 13 12 11 21 22 23 24 25 26 27 28

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

47 46 45 44 43 42 41 31 32 33 34 35 36 37

DT=

MT=

FT =

DMFT score =

HARD TISSUE EXAMINATION

NO OF TEETH PRESENT:

DECAYED / MISSING / FILLED TEETH:

FRACTURED TEETH:

MOBILITY:

OCCLUSION:

SOFT TISSUE EXAMINATION:

SWELLING:

SINUS OPENING:

ANNEXURE - X
SCHOOL PERMISSION LETTER

PERMISSION LETTER

Kelambakkam
24-11-2017

From,
The Head of Department,
Department of Pedodontics and Preventive Dentistry
Chettinad Dental College and Research Institute
Kelambakkam- 603 103

To,
The Principal
Bhuvana Krishnan School
Kelambakkam 603 103

Sub: Permission for conducting School dental health education program, screening and providing free treatment to school children from 1st standard to 6th standard in the 1st stage. Transport will be provided by Chettinad dental college

Respected Sir/ madam,

We the department of Pedodontics ,Chettinad dental college and Research Institute is planning to conduct school dental health education program for the students of schools in and around Kelambakkam. The students will be brought to the department in groups of 30, and taught about dental hygiene practice using models, videos and demonstrations. And screened for dental problems . Once the problems are Identified the following treatments will be done free of cost.

1) Scaling (cleaning), 2)Restorations (fillings), 3) Root canal treatments, 4) crowns (caps),
5) Minor Orthodontic correction using removable appliances
Since the dental health education program and the treatment procedure requires parental presence, we will be glad to provide free screening , cleaning and restorations free of cost for accompanying parent also. The timing of program will be finalized once the school permission is given.

We request you to please give us permission which will benefit your school children and their parents in a big way and help us fulfilling our social commitment

Thanking you,

The Principal
CDCRI



Yours faithfully
Dr. Joe Louis

Department of Pedodontics
Chettinad Dental College and Research Institute
Kelambakkam - 603 103

The Principal
Bhuvan Krishnan School
Kelambakkam

In the month of
July .
In the month of
January 2018
Dr
26/11/17

ANNEXURE - XI

RESEARCH METHODOLOGY CERTIFICATE



The Tamil Nadu Dr.M.G.R. Medical University
69, Anna Salai, Guindy, Chennai - 600 032.



DEPARTMENT OF EPIDEMIOLOGY
CREDIT POINTS : 30


This certificate is awarded to Dr./Mr./Ms. **R A SOWMIYA SREE**

for participating as a Delegate in the three days Workshop on 'Research Methodology and Biostatistics : How to do a Good Dissertation & Publish?'

from 18 - 12 - 2019 to 20 - 12 - 2019.


Dr.G. SRINIVAS
PROFESSOR & HEAD
DEPARTMENT OF EPIDEMIOLOGY


Dr.PARAMESWARI SRIJAYANTH
REGISTRAR


Dr.SUDHA SESHAYYAN
VICE-CHANCELLOR