EFFECTIVENESS OF A SCHOOL ORAL HEALTH EDUCATION INTERVENTION AMONG 6-12 YEAR OLD CHILDREN IN THIRUVANANTHAPURAM EDUCATIONAL DISTRICT: A CLUSTER RANDOMIZED CONTROLLED TRIAL

NEETHU SURESH

Ph.D. THESIS
2020

SREE CHITRA TIRUNAL INSTITUTE
FOR
MEDICAL SCIENCES AND TECHNOLOGY, TRIVANDRUM
Thiruvananthapuram

EFFECTIVENESS OF A SCHOOL ORAL HEALTH EDUCATION INTERVENTION AMONG 6-12 YEAR OLD CHILDREN IN THIRUVANANTHAPURAM EDUCATIONAL DISTRICT: A CLUSTER RANDOMIZED CONTROLLED TRIAL

A THESIS PRESENTED BY

NEETHU SURESH

TO

THE SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY, TRIVANDRUM

Thiruvananthapuram

IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE AWARD OF
DOCTOR OF PHILOSOPHY

2020

Declaration by the student

CERTIFICATE

I, Neethu Suresh hereby certify that I had personally carried out the work depicted in the thesis entitled, "Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: A cluster randomized controlled trial". No part of the thesis has been submitted for the award of any other degree or diploma prior to this date.

Signature:

Date: 08.08.2020 Name of the candidate: Neethu Suresh

Declaration by the guide

Name of the guide: Prof. V. Ramankutty

Division/Department: Achutha Menon Centre for Health Science Studies

This is to certify that Neethu Suresh in the department of Achutha Menon Centre for Health Science Studies of this institute has fulfilled the requirements prescribed for the Ph.D degree of the Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum.

The thesis entitled, "Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: A cluster randomized controlled trial" was carried out under my direct supervision. No part of the thesis was submitted for the award of any degree or diploma prior to this date.

Date: 08.08.2020

Declaration by the co-guide

Name of the guide : Prof. K.R. Thankappan

Division/Department: Professor, Department of Public Health and Community Medicine, Central University Kerala, Kasaragod, Kerala.

This is to certify that Neethu Suresh in the department of Achutha Menon Centre for Health Science Studies of this institute has fulfilled the requirements prescribed for the Ph.D degree of the Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum.

The thesis entitled, "Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: A cluster randomized controlled trial" was carried out under my direct supervision. No part of the thesis was submitted for the award of any degree or diploma prior to this date.

Date: 08.08.2020 Signature:

Approval of thesis

This thesis entitled

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: A cluster randomized controlled trial

Submitted by

Neethu Suresh

for the degree of

Doctor of Philosophy of

SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY

Thiruvananthapuram

Is evaluated and approved by

Name of the Guide

Prof. V.Ramankutty

Name of thesis examiner

Dr.B.Unnikrishnan

ACKNOWLEDGEMENTS

I would like to begin by thanking God Almighty, for the blessings and the courage he gave to 4complete this research work.

I am extremely grateful to my first guide and current co-guide Prof K.R. Thankappan for guiding me throughout the course; for replying to my emails in no time and for always giving me clear directions on how to proceed my work. I am awfully thankful to my guide Prof. V. Ramankutty for agreeing to guide me after Prof. K.R.Thankappan retied and for his continuous support, patience and motivation during the course of my study. I would like to thank my Doctoral Advisory Committee (DAC) member Prof. P S Sarma for his support, especially for helping me to develop the methodology part of the study and for guiding me regarding the statistical analysis part of the study. I am grateful to my DAC member Dr. K. Nandakumar for encouraging me and for providing valuable comments in spite of his busy schedule.

I would like to thank all the faculty members of Achutha Menon Centre for Health Science Studies especially Prof. Mala Ramanathan and former Prof. T.K Sundari Ravindran for their valuable suggestions to improve the study. I am thankful to Dr. G.K Mini, Associate Professor, Global Institute of Public Health, Ananthapuri Hospitals, Thiruvananthapuram for her neverending support and encouragement. I am thankful to Dr. Chandrashekar Janakiram, National Institutes of Health, National Library of Medicine and National Institute of Dental and Craniofacial Research, USA for his valuable suggestions which helped me to improve my study.

I am extremely grateful to Mrs. Jessy Joseph, Additional Director of Public Instruction (General) and the Deputy Director of Education Thiruvananthapram for permitting me to conduct this study. I would like thank the head masters/mistress, teachers, students and parents who whole heartedly participated in this study; without them this study would never have been possible.

I am thankful to all my former and current co-Ph.D scholars especially Dr. Malu Mohan, Dr. Reethu S, Dr. Sreejini J, Dr. Uma Santhosh, Dr. Neena Elezebeth, Philip, Dr. Rekha Ravindran, Dr. Elizebeth Mathews, Mrs. Joanna Sara Valson, Mr. Bevin Vinay Kumar, Miss Sunu C Thomas, Dr. Hisham Moosan, Dr. Antony Stanley, Mr. Sabu K.U, Dr. Jithesh V, Miss. Sapna Mishra, Dr. Tijo George, Miss Jayalakshmi Rajeev, Mrs Shani S.D, Mrs Shalini Garg and MPH and students of2015 batch for their unconditional support and help.

I would like to thank the office staff of Achutha Menon Centre for Health Science Studies, library and academic office staff of Sree Chitra Tirunal Institute for Medical Sciences and Technology for their co-operation and support throughout all these years of study.

I am grateful to Dr. Deepan Kumar CV, Assistant Professor, PMS College of Dental Science and Research, Thiruvananthapuram for his support. I am thankful to Dr. Benitta, Dr. Reshma, Dr. Renuka, Dr. Ashni and Dr. Gopika for helping me in data collection. I would also like to thank staff of Vayalil Specialst Dental Care Dr. Dhanya, Dr.Gopika, Mrs Adithya, Mrs Ashwathy and MrsSandhya for their support.

Last but not the least I would like thank my family. The unconditional love and blessing of my parents Dr. K. Suresh Kumar and Dr. K. Sarala Kumari K gave me strength to complete this study through all hardships. I am thankful to my husband Dr. Aravind A. Vijayan and son Master Gauthan Neethu Aravind for their love, support and patience throughout these years. I would also like to thank my in-laws Mr. Vijayan S and Mrs Ani Kmari and brother in law Mr. Akash A. Vijayan for their support.

TABLE OF CONTENTS

Appendix 7	Oral health assessment by clinical oral examination	A7 a - b
Appendix 8i	Guidelines for conducting IDIs with parents of children who showed extremes of oral hygiene status in the baseline survey (English version)	A8i
Appendix 8ii	Guidelines for conducting IDIs with parents of children who showed extremes of oral hygiene status in the baseline survey (Malayalam version)	A8ii
Appendix 9i	Post intervention survey- structured interview schedule (English version)	A9i a - e
Appendix 9ii	Post intervention survey- structured interview schedule (Malayalam version)	A9ii a - e
Appendix 10i	Guidelines for conducting FGDs with teachers of children in the intervention group (English version)	A10i
Appendix 10ii	Guidelines for conducting FGDs with teachers of children in the intervention group (Malayalam version)	A10ii
Appendix 11i	Guidelines for conducting FGDs with parents of children in the intervention group (English version)	A11i
Appendix 11ii	Guidelines for conducting FGDs with parents of children in the intervention group (Malayalam version)	A11ii
Appendix 12i	Participant information sheet for teachers- FGDs with teachers of 6-12 old school children (English version)	A21i
Appendix 12ii	Participant information sheet for teachers - FGDs with teachers of 6-12 old school children (Malayalam version)	A12ii
Appendix 13i	Consent form for teachers- FGDs with teachers of 6-12 old school children (English version)	A13i
Appendix 13ii	Consent form for teachers- FGDs with teachers of 6-12 old school children (Malayalam version)	A13ii
Appendix 14i	Participant information sheet for parents- FGDs with parents of 6-12 old school children (English version)	A14i
Appendix 14ii	Participant information sheet for parents- FGDs with parents of 6-12 old school children (Malayalam version)	A14ii
Appendix 15i	Consent form for parents- FGDs with parents of 6-12 old school children (English version)	A15i
Appendix 15ii	Consent form for parents- FGDs with parents of 6-12 old school children (Malayalam version)	A15ii

Appendix 16i	Participant information sheet for parents - Baseline survey and clinical oral examination among children (English version)	A16i
Appendix 16ii	Participant information sheet for parents - Baseline survey and clinical oral examination among children (Malayalam version)	A16ii a - b
Appendix 17i	Consent form for parents - Baseline survey and clinical oral examination among children (English version)	A17i
Appendix 17ii	Consent form for parents - Baseline survey and clinical oral examination among children (Malayalam version)	A17ii
Appendix 18i	Participant information sheet for children - Baseline survey and clinical oral examination among children (English version)	A18i
Appendix 18ii	Participant information sheet for children - Baseline survey and clinical oral examination among children (Malayalam version)	A18ii a - b
Appendix 19i	Assent form for children - Baseline survey and clinical oral examination among children (English version)	A19i
Appendix 19ii	Assent form for children - Baseline survey and clinical oral examination among children (Malayalam version)	A19ii
Appendix 20i	Participant information sheet for parents - In depth interviews with parents of 6-12 year old school children showing extremes of oral hygiene status in the baseline survey (English version)	A20i
Appendix 20ii	Participant information sheet for parents - In depth interviews with parents of 6-12 year old school children showing extremes of oral hygiene status in the baseline survey (Malayalam version)	A20ii
Appendix 21i	Consent form for parents - In depth interviews with parents of 6-12 year old school children showing extremes of oral hygiene status in the baseline survey (English version)	A21i
Appendix 21ii	Consent form for parents - In depth interviews with parents of 6-12 year old school children showing extremes of oral hygiene status in the baseline survey (Malayalam version)	A21ii
Appendix 22i	Participant information sheet for parents – Oral health	A22i

	education intervention, post intervention survey and clinical oral examination (English version)	
Appendix 22ii	Participant information sheet for parents – Oral health education intervention, post intervention survey and clinical oral examination (Malayalam version)	A22ii a - b
Appendix 23i	Consent form for parents – Oral health education intervention, post intervention survey and clinical oral examination (English version)	A23i
Appendix 23ii	Consent form for parents – Oral health education intervention, post intervention survey and clinical oral examination (Malayalam version)	A23ii
Appendix 24i	Participant information sheet for children– Oral health education intervention, post intervention survey and clinical oral examination (English version)	A24i
Appendix 24ii	Participant information sheet for children– Oral health education intervention, post intervention survey and clinical oral examination (Malayalam version)	A24ii a - b
Appendix 25i	Assent form for children– Oral health education intervention, post intervention survey and clinical oral examination (English version)	A25i
Appendix 25ii	Assent form for children– Oral health education intervention, post intervention survey and clinical oral examination (Malayalam version)	A25ii
Appendix 26i	Participant information sheet for teachers - FGDs with teachers of children in the intervention group (English version)	A26i
Appendix 26ii	Participant information sheet for teachers - FGDs with teachers of children in the intervention group (Malayalam version)	A26ii
Appendix 27i	Consent form for teachers - FGDs with teachers of children in the intervention group (English version)	A27i
Appendix 27ii	Consent form for teachers - FGDs with teachers of children in the intervention group (Malayalam version)	A27ii

Appendix 28i	Participant information sheet for parents - FGDs with parents of children in the intervention group (English version)	A28i
Appendix 28ii	Participant information sheet for parents - FGDs with parents of children in the intervention group (Malayalam version)	A28ii
Appendix 29i	Consent form for parents - FGDs with parents of children in the intervention group (English version)	A29i
Appendix 29ii	Consent form for parents - FGDs with parents of children in the intervention group (Malayalam version)	A29ii
Appendix 30	Oral health education video - Slides	A30 a - f
Appendix 31	The tooth brushing model and the tooth brush	A31
Appendix 32i	Chart 1	A32i
Appendix 32ii	Chart 2	A32ii
Appendix 32iii	Chart 3	A32iii
Appendix 32iv	Chart 4	A32iv
Appendix 33i	Pamphlet side 1	A33i
Appendix 33ii	Pamphlet side 2	A33ii
Appendix 34	The Brushing Chart	A34
Appendix 35	The Plagiarism analysis report	A35

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

CI-S	Calculus Index - Simplified
CRP	C Reactive Protein
CTRI - NIMS	Clinical Trials Registry India – National Institute of Medical Statistics
DI-S	Debris Index - Simplified
DMFT	Decayed Missing Filled Teeth
def	Decayed extracted filled
DLE	Discoid Lupous Erythematosus
DALY	Disability Adjusted Life Years
DNA	Deoxy- ribo Nucleic Acid
EVS	Environmental Studies
FDI	Federation Dentaire Internationale
FGD	Focus Group Discussion
GI	Gingival Index
GBD	Global Burden of Disease
IDI	In Depth Interview
IEC	Institutional Ethics Committee
IL	Interleukin
INF	Interferon
LMIC	Low and Middle Income Countries
NHM	National Health Mission
NIDCR	National Institute of Dental and Craniofacial Research
OHE	Oral Health Education
OHRK	Oral Health Related Knowledge
OHRA	Oral Health Related Attitude

OHRP	Oral Health Related Practices
OHI-S	Oral Hygiene Index - Simplified
OBC	Other Backward Caste
PHC	Primary Health Centre
PRECEDE–PROCEED	Predisposing, Reinforcing, and Enabling Constructs in Educational/Environmental Diagnosis and Evaluation. - Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development
SES	Socio Economic Status
SC	Scheduled Caste
ST	Scheduled Tribe
SLE	Systemic Lupus Erythematosus
TNF	Tumor Necrosis Factor
WHO	World Health Organization

SYNOPSIS

Oral health is a state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal disease, dental caries, tooth loss, other diseases and disorders that affect the oral cavity. The major oral diseases seen in children are dental caries and gingivitis. Dental caries and gingivitis are preventable in their early stages by improving the oral hygiene status of the children. Oral Health Education (OHE) is an important method of public health intervention that aims to improve knowledge, which may lead to the adoption of favorable oral health behaviors that contribute to better oral hygiene status and in turn better oral health. The most appropriate time to provide OHE to children is 6-12 years, because it is the time of mixed dentition; first permanent tooth erupts by the age of 6 years. Schools provide the most favorable environment to impart oral health education to children because they provide an efficient and effective way to reach out to children. OHE intervention could be more beneficial for participants if it is guided by health behavior theories. In India there have been school oral health education interventions among 6-12 year old children; but till date no in India has used the PRECEDE–PROCEED model as a framework for development, implementation and evaluation health behavior theory based school oral health education (OHE) intervention program 6-12 year old children. So, we hypothesized that such an intervention would be effective in improving the oral hygiene status of 6-12 year old school children.

The major objective of the study was to find out the effect of a school OHE intervention involving three sessions of oral health education classes by the dentist at one month apart on the oral hygiene status among 6-12 year old school children in Thiruvananthapuram educational district compared to that of a control group that received no intervention. Minor objectives were to estimate the prevalence of dental caries and gingivitis among 6-12 year old school children in Thiruvananthapuram educational district; to find out the effect of a school OHE intervention involving three sessions of oral health education classes by the dentist at one month apart on prevalence of gingivitis and on oral health related knowledge, attitude and

practices among 6-12 year old school children in Thiruvananthapuram educational district compared to that of a control group that received no intervention.

The study was a cluster randomized controlled trial. The study setting was Thiruvananthapuram educational district. The sample size was calculated based on the major objective. Expecting an improvement of 0.36 in the mean Oral Hygiene Index – Simplified (OHI-S) score between the intervention and control group after the intervention at alpha 0.05 and 80% power and assuming a design effect of 2 and 13% loss to follow up, the sample size calculated was 225 per group. In Thiruvananthapuram educational district there were 27 schools which met the inclusion criteria which were set for the schools. Multi stage cluster sampling was used. In the first stage schools were selected and in the second stage class divisions were selected. Class divisions were the clusters. Children in age group 6-12 years study in first to seventh standard. Total strength of all class divisions from standard one to seven in the 27 schools were divided by total number of class divisions in standard one to seven in those schools and the average cluster size was calculated; it was 29. In order to obtain sample size of 225 per group 7.7 (225/29) clusters had to be selected; so, eight clusters per group were selected. To get best possible representation of the eligible schools, from one school only one class division was selected. In the total strength of all class divisions from standard one to seven in the 27 schools 43% was from urban schools and 57% were from rural schools. So, in each group 3 class divisions were selected from urban schools and 5 class divisions were selected from rural schools. Total six urban schools and 10 rural schools were involved in the study.

The study was conducted in three phases. The study phases were planned based on the PRECEDE–PROCEED model which provides an educational frame work for the development of health education interventions based on health behavior theories.

Phase 1 was the development of a school OHE intervention plan for 6-12 year old children. In the first stage six urban schools and 10 rural schools were randomly selected from the list of 27 eligible schools. In the second stage one class division was randomly selected from each of this school from the list of the class division from standard one to seven. Then eight FGDs

were conducted with parents and six FGDs were conducted with teachers of children in those selected class divisions. FGDs were conducted based on the principles of participation and relevance. FGDs were conducted to understand the oral hygiene habits and related situations of 6-12 year old children by gathering information directly from their parents and teachers. The FGDs helped us to understand the areas were children needed awareness and training, how to conduct the OHE classes, the OHE materials to be developed, the role teachers could play in the OHE intervention, how oral health information could be provided to parents and teachers. FGDs were followed by baseline survey including clinical oral examination of the children. The baseline survey helped to achieve the educational and ecological assessment part of the phase 3 of the PRECEDE–PROCEED model. Clinical oral exanimation helped to achieve epidemiological assessment part the phase 2 of the PRECEDE–PROCEED model. Baseline survey was conducted among 465 children. Along with general information on children, information regarding their oral health related knowledge attitude and practices were also collected. In the clinical oral examination the oral hygiene status of the children were recorded using Oral Hygiene Index – Simplified (OHI-S), their gingival status was recorded using Gingival Index (GI), dental caries status of the permanent teeth was recorded using Decayed Missing and Filled Teeth (DMFT) index and dental caries status of deciduous teeth was recorded using Decayed Extracted and Filled (def) index. The baseline data analysis gave us the prevalence of gingivitis and dental caries among the 6-12 year old children. The baseline data analysis also indicated the areas in which children needed awareness and training.

After baseline survey in depth interviews (IDIs) were conducted with parents of children who had showed extremes of oral hygiene status in the baseline clinical oral examination; those children's baseline OHI-S score were either below 0.20 or above 4.5. In depth interviews helped us to achieve behavioral and environmental assessment part of the phase 2 of PRECEDE–PROCEED model. IDIs were guided by theory of planned behavior. IDIs helped us to understand the behaviors of the children responsible for their oral health status and the external factors beyond control of the children responsible for their behavior. Total of 4 IDIs

were conducted.

The school oral health education intervention program was developed based on the information gathered from the FGDs, baseline survey and in depth interviews. The intervention development corresponded to phase 4 (intervention alignment) of the PRECEDE–PROCEED model. It was guided by health belief model. A 20 minutes oral health education video was developed. Topics included were importance of teeth; importance of deciduous teeth; causes, symptoms, sequelae and prevention of dental caries and gum diseases; how oral health is related to general health; dietary habits good for oral health; dietary habits bad for oral health; importance of twice daily tooth cleaning with tooth brush and tooth paste; importance of morning tooth brushing after breakfast; tooth brushing technique detrimental effects of tooth cleaning with materials like charcoal, salt, pepper, tooth powder; when to change tooth brush; how much tooth paste to be taken; tongue cleaning technique; importance of washing mouth after meals and snacks; what to do and what not to do if you experience tooth pain or bleeding from gums; importance of reduced intake of sweets, packed food items, packet juices and soft drinks; harmful effects of tobacco; importance of regular dental checkups every six months. All these topics were covered in a simple manner with the help of cartoons and pictures in the video. The tooth brushing model and tooth brush were used to demonstrate the tooth brushing technique and tongue cleaning technique to the children.

A total of four charts were developed and one pamphlet were developed, with information printed on both sides of it. First two charts included the main points of all the topics which were covered in the OHE class. The third chart illustrated the brushing technique. The fourth chart dealt with the shedding time of deciduous teeth and eruption time of permanent teeth. The also covered all the information included in the charts. Monthly brushing charts were developed as a reminder for twice daily brushing. It had boxes for the children to put tick mark after they did tooth brushing during morning and at night. There were also boxes where the class teachers could write their comment or put ‘star mark’.

After data collection in phase 1, the six urban class divisions were randomly divided into 2

groups and 10 rural class divisions were randomly divided into 2 groups; one group was the intervention group and the other was the control group. Each group had eight class divisions which included three urban class divisions and five rural class divisions.

Phase 2 involved the implementation of the oral health education intervention program developed in phase 1 in the intervention group for 3 months. This phase was in accordance with phase 5 (implementation phase) of the PRECEDE–PROCEED model. The phase 2 of study involved 453 children, 228 in the control group and 225 in the intervention group. The intervention group received three sessions of oral health education classes by the dentist at one month apart. During this phase children in the control group neither received any OHE class nor the OHE materials.

The oral health education classes were taken with the help of the 20 minute video developed. After class the children were divided into four to five groups and each group were demonstrated the modified bass tooth brushing technique and tongue cleaning technique by a dentist with help of a model and tooth brush. After that each child was given a chance to do the brushing technique and the tongue cleaning technique on the model. Charts were pasted on the class rooms. Pamphlets and brushing charts were distributed among the children. Children were requested to take the pamphlets to their parents and family members. Pamphlets were also distributed to the teachers and staff in the school. It was clearly explained to the children how they have to make use of the brushing chart. As per our instructions the class teachers reminded and encouraged the children to brush twice daily during the regular school days and at the end of every month after the OHE class they checked the brushing charts of the children and gave their comments.

In Phase 3 the effectiveness of the school oral health education intervention was evaluated. It involved post intervention survey including clinical oral examination among intervention and control group, followed by FGDs with parents and teachers of children in the intervention group.

Post intervention survey was conducted among 453 children who were there in the phase 2.

Information regarding their oral health related knowledge attitude and practices were collected. In the post intervention clinical oral examination the Oral Hygiene Index – Simplified (OHI-S), Gingival Index (GI), Decayed Missing and Filled Teeth (DMFT) index and Decayed Extracted and Filled (def) index were recorded. Comparison of the data from post intervention survey between intervention and control group helped us to achieve the phase 7 of the PRECEDE–PROCEED model (impact evaluation). Comparison of the data from post intervention clinical oral examination between intervention and control group helped us to achieve the phase 8 of the PRECEDE–PROCEED model (outcome evaluation).

The FGDs with parents and teachers of children in the intervention group helped to achieve the phase 6 (process evaluation) of the PRECEDE–PROCEED model. The FGDs were conducted based on the principles of participation and relevance. Four FGDs were conducted with parents and three FGDs were conducted with teachers of children in the intervention group. The FGDs helped us to understand regarding the usefulness of the program and the suggestions for the improvement of the program gathering information directly from their parents and teachers of children in the intervention group.

After data collection in phase 3, due to ethical consideration the children in the control group received one session of OHE class and tooth brushing technique demonstration by the dentist. They also received the OHE materials like charts, pamphlets and brushing charts.

Results showed that at baseline control and intervention groups were similar with regards to oral heal related knowledge score, oral heal related attitude score, oral heal related practice score, OHI-s score, GI score, DMFT score and def score.

The major finding of the study was that post intervention, in the intervention group the mean OHI-S score decreased from 2.02 ±0.87 at the baseline to 1.65±0.80; while in the control group the mean OHI-S score slightly increased from the baseline value of 2.020±0.87 to 2.18±0.16. There was significant dissimilarity in the differences of OHI-S score between the two groups indicating that the OHE intervention program was effective in improving the oral hygiene status of the children. The importance of this finding was that the improvement occurred even when

the children were having a fair oral hygiene status at the baseline. This was possible because the intervention was planned and implemented after carefully understanding the health problems, health behaviors, social and familial situations of the children.

Other important findings of the study were

- The OHE intervention program was effective in improving the gingival health status of the 6-12 year old children.
- In the intervention group the OHE intervention resulted an increase in the prevalence of normal and mild gingivitis and a decrease in the prevalence of moderate and severe gingivitis indicating an improvement in the gingival health status of the children in the intervention group.
- The OHE intervention program was effective in improving the oral health related knowledge, attitude and practices of the 6-12 year old children.
- The prevalence of dental caries among 6-12 year old children was 67.1% (62.73 - 71.26%). The prevalence of dental caries in deciduous dentition of 6-12 year old children was 52.25% (47.71-56.78%) and the prevalence of dental caries in permanent dentition of 6-12 year old children was 37.2% (32.90 – 41.67%). About 22.4% of children had dental caries in both deciduous and permanent dentition.
- About 98.9% of children had some form of gingivitis. The prevalence of mild gingivitis was 73.11% (69.09 – 77.15%) and that of moderate gingivitis was 24.9% (21.17 – 29.03%). Severe gingivitis was prevalent in 0.86% (0.23 – 2.18%) of children.

To conclude the significance of the findings of the study were that they showed the effectiveness of health behavior theory based school OHE intervention in improving the oral hygiene status of 6-12 year old children.

CHAPTER – 1

INTRODUCTION

1.1. Inroduction

Oral health is a state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal disease, dental caries and tooth loss, and other diseases and disorders that affect the oral cavity (WHO. 2019a). Oral health is necessary to general health and well-being at every stage of our life.(Dental Health Services. 2011).

Oral diseases are a global public health problem. Their prevalence is increasing among the low- and middle-income countries (LMIC). They cause serious health and economic burdens, and reduce the quality of life of those affected. (Peres et al. 2019)

The costs of treating oral diseases impose large economic burdens to families and health-care systems (Peres et al. 2019). Therefore, the best possible approach to tackle the burden of oral diseases is to focus on prevention.

Poor oral health can lead to pain and tooth loss. In children this could affect their appearance, self-esteem, speech, quality of life, nutritional intake and consequently their growth and development (Nalli et al. 2017). Poor oral health can have a detrimental effect on children's performance in school (Ruff et al. 2019) The major oral diseases seen in children are dental caries and gingivitis (WHO. 2019b).

Dental caries and gingivitis are preventable in their early stages by improving the oral hygiene status of the children. Oral Health Education (OHE) is an important method of public health intervention that aims to improve knowledge, which may lead to the adoption of favorable oral health behaviors that contribute to better oral hygiene status and in turn better oral health (Rong

et al. 2003). OHE intervention could be more beneficial for participants if it is guided by health behavior theories. The most appropriate time to provide OHE to children is 6-12 years, because it is the time of mixed dentition; first permanent teeth erupts by the age of 6 years. Schools provide the most favorable environment to impart oral health education to children because they provide an efficient and effective way to reach out to children. To the best of my knowledge, in India till date no study has evaluated the effectiveness of health behavior theory based school OHE intervention in 6 to 12 year old children.

1.2. Objectives of the study

1.2.1. Major objective

The major objective of the study was to find out the effect of a school OHE intervention involving three sessions of oral health education classes by the dentist at one month apart on the oral hygiene status among 6-12 year old school children in Thiruvananthapuram educational district compared to that of a control group that received no intervention.

1.2.2. Minor objectives

1. To estimate the prevalence of dental caries among 6-12 year old school children in Thiruvananthapuram educational district
2. To estimate the prevalence of gingivitis among 6-12 year old school children in Thiruvananthapuram educational district
3. To find out the effect of a school OHE intervention involving three sessions of oral health education classes by the dentist at one month apart on prevalence of gingivitis among 6-12 year old school children in Thiruvananthapuram educational district compared to that of a control group that received no intervention
4. To find out the effect of a school OHE intervention involving three sessions of oral health education classes by the dentist at one month apart on oral health related

knowledge, attitude and practices among 6-12 year old school children in Thiruvananthapuram educational district compared to that of a control group that received no intervention

CHAPTER – 2

LITERATURE REVIEW

2.1. Oral health

Oral health is "a state of being free from chronic mouth and facial pain, oral and throat cancer, oral infection and sores, gum disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing" (FDI. 2015).

2.2. Importance of oral health

Dentition is important for performing many important functions and for the development the face. Many systemic diseases show manifestations in oral cavity. Poor oral health can affect psychological wellbeing, quality of life, and general health.

During every stage of life, a healthy and well-functioning dentition is important because it supports essential human functions, such as speaking, smiling, socializing and eating. Properly developed dentition is needed to give the face its individual shape and form (FDI. 2015).

Oral health and general health are closely related. Many systemic diseases will have oral manifestations (Gaddey. 2017). These systemic diseases include

- autoimmune diseases like Systemic lupus erythematosus (SLE), discoid lupus eryhematosus (DLE), systemic sclerosis, sjögren syndrome, amyloidosis, pemphigus vulgaris, Wegener granulomatosis, Crohn disease, Behçet syndrome, nign mucus membrane pemphi-goid, sarcoidosis, and lichen planus.
- hematological diseases like anemia, leukemia, thrombocytopenia and multiple myeloma

- endocrine diseases like diabetes mellitus, thyroids disease, parathyroid diseases, and adrenal diseases.
- neoplasms like kaposi sarcoma,

Poor oral health can have detrimental consequences on physical and psychological wellbeing (FDI. 2015). Poor oral health can adversely affect the quality of the life of people (Bennadi & Reddy. 2013). People with poor oral health will have chewing problems which will in in turn affect their nutritional intake. The greater the number of missing teeth, the poorer will be the quality of life (Naito et al. 2006).

There is strong evidence which suggests that poor oral health can impair systemic health. Periodontitis is an advanced stage of gum disease. Periodontitis affects the supporting structures of the teeth leading to progressive loss of bone around teeth. The disease is initiated by bacteria and their components like lipopolysaccharide and causes a heightened host inflammatory response. This cascade of inflammatory response will produce to increased systemic levels of acute phase proteins, plasma antibody levels, coagulation factor, total white blood cell count, neutrophils, C reactive protein (CRP), and cytokines such as INF- gamma (Interferon gamma), TNF-α (Tumor necrosis Factor- Alpha), IL (Interleukin)-1β, IL-2 and IL-6. This will lead to adverse effects on the systemic health (Hegde and Awan, 2019). There is bidirectional link between the periodontitis and diabetes (Preshaw et al., 2012). Other systemic diseases associated with periodontitis include cardiovascular disease, respiratory diseases, chronic kidney diseases, rheumatoid arthritis, cognitive impairment, obesity, metabolic syndrome, cancer, adverse pregnancy outcomes, cerebrovascular accident (Parihar et al. 2015) (Winning & Linden. 2015).

2.3. The burden of oral diseases

Oral diseases represents a major public health challenge globally for almost all countries including India (FDI. 2015). The fact the oral diseases affects a vast majority of people and that their treatment costs are high makes them major public health challenge.

According to the global burden of disease study which included 291 conditions, dental caries of permanent teeth (29-35%) was the most common disease condition prevalent among human population; periodontal diseases (10-79%) was at the sixth position and dental caries of deciduous teeth (9-12%) was at the tenth position (Vos et al. 2012). The global burden of disease study also reported that oral disease were responsible for 15 million Disability Adjusted Life Years (DALYs) in 2010 which was an average health loss of 224 years per 100,000 people (FDI. 2015).

According to the global burden of disease study 2017 about 2·3 billion people were affected by caries of permanent teeth, 0.53 billion children were affected by caries of deciduous teeth and 0.79 billion people were affected by periodontal diseases (GBD collabrators. 2018).

In India among every 100,000 people about 32,957 were affected by dental caries and among every 1000,000 people about 16,503 were affected by periodontal diseases; and approximately 14 DALYs are lost due to dental caries and about 56.69 DALYs were lost due to periodontal diseases (Balaji. 2018).

World Health Organization (WHO) has reported that oral diseases are the fourth most expensive diseases to treat. According to WHO in high-income countries about 5% of total health expenditure and 20% of out-of-pocket health expenditure were spend on treatment of oral diseases. Annual expenditure of European countries were about €79 billion and that of USA was US$110billion. WHO also reports that in most low-and middle-income countries (LMICs)

the health care systems are not that well equipped and most often oral health care demands becomes beyond the capacities of the available health care systems (WHO. 2019a).

Oral treatment expenditure forms a major part of the household medical spending. In case of oral health care major health care providers are the private sector, so the out of pocket expenditure for oral health care needs are high. In case of the general health expenditure about 20 percent of the total health expenditure is out of pocket expenditure but for dental care about 55 percent of the total dental care expenditure is out of pocket expenditure (FDI. 2015).

The indirect costs related to oral conditions also cause significant burden on affected population, in addition to treatment costs. Oral diseases can result in loss on hours of work and reduce a person's productivity and academic achievement. An average of 320.8 million work or school hours were lost annually for dental care in the United States(Kelekar & Naavaal. 2018).

2.4. Effect of poor oral health on children

Poor oral health can have a detrimental effect on their quality of life, children's performance in school, and their success in later life.

A healthy mouth is need for an individual to speak, eat and socialize. Oral diseases can lead to pain and tooth loss; which will affect the appearance, quality of life, nutritional intake and consequently the growth and development of the children (Nalli et al. 2017). Untreated oral diseases resulting in pain can lead to eating and sleeping difficulties in children (FDI. 2015) Loss of teeth can affect the social interactions in children and cause emotional stress in children thus affecting their quality of life (Alsumait et al. 2015), (FDI. 2015).

Children with poorer oral health status were more likely to experience dental pain and missed many hours of school due to oral pain (Jackson et al. 2011). Children who suffer from poor

oral health are 12 times more likely to have more restricted-activity days including missing school than those who do not. Oral diseases have resulted in loss of more than 50 million hours annually from school. (Prabhu & John. 2015). Poor oral health was also related to children's poor performance in school (Jackson et al. 2011).

2.5. Most common oral diseases in children

The major oral diseases seen in children are dental caries and gingivitis. The main etiologic factor causing dental caries and gingivitis is dental plaque (bacterial biofilm).

2.5.1. Dental plaque

Dental plaque clinically as a structured, resilient, yellow-grayish substance that adheres tenaciously to the intraoral hard surfaces, including removable and fixed restorations. It is impossible to remove dental plaque by rinsing or water sprays. *Organic constituents* of the dental plaque matrix include polysaccharides, proteins, glycoproteins, lipid material, and bacterial deoxy ribo nucleic acid (DNA). The *inorganic components* of dental plaque are predominantly calcium and phosphorus, with trace amounts of other minerals such as sodium, potassium, and fluoride (Dwarakanath et al. 2016).

Mineralized dental plaque is calculus. As the mineral content increases, the plaque mass becomes calcified to form calculus. Calculus is a hard deposit and is generally covered by a layer of unmineralized plaque.

Materia alba refers to soft accumulations of bacteria, food matter, and tissue cells that lack the organized structure of dental plaque and that are easily displaced with a water spray. It usually has a white cheese like appearance. Debris is soft and contains mucin, bacteria and food varying in color from grayish white to green or grange.

The main component of dental plaque are microorganisms encased within an extracellular matrix. One gram of plaque (wet weight) contains approximately 10^{11} bacteria. (Dwarakanath et al. 2016). Dental plaque biofilm consists of approximately 600 different species of bacteria. Several of the bacterial species have been associated with causing tooth decay. The main bacterial species causing tooth decay are Streptococcus mutans. The inflammatory mediators released by the dental plaque microbes and also by the host cells in response to the microbial challenge raised by the plaque microbes results in inflammation leading to gingivitis. When the disease progress there will be destruction of connective tissue and bone leading to periodontis. The main bacterial species causing gingivitis and periodontis are *Porphyromonas gingivalis*, *Prevotella intermedia*, Treponema denticola, Tannerella forsythia, Aggregatibacter actinomycetemcomitans and Fusobacterium nucleatum (Dwarakanath et al. 2016).

2.5.2. Dental caries

Dental caries (tooth decay) is a multifactorial disease, caused by the interaction between the dental plaque (the bacterial biofilm), the tooth surface, and sugars and starches from foods and drinks. Biofilm bacteria metabolize sugars and produce acids, which over time break down tooth enamel causing it to lose minerals (FDI. 2015), (NIDCR. 2019).

In early stages of dental caries, there are usually no symptoms and if intervened at early stage it can be arrested. As the stage advances there will be toothache (tooth pain) or tooth sensitivity to sweets, hot, or cold. Over the time there will be formation of cavity. After cavity formation if tooth function has to be restored decayed tissue has to be removed and filling has to be placed. If left untreated the decayed tooth can become infected leading to abscess formation, pain, facial swelling, and fever; at this stage, root canal treatment or extraction tooth becomes necessary (FDI. 2015), (NIDCR. 2019).

2.5.3. Gingivitis

Main etiology of gingivitis is inadequate oral hygiene which leads to accumulation of dental plaque (bacterial biofilm) that contains harmful bacteria and bacterial products leading to cause chronic inflammation of the gum adjacent to the tooth surface, erythematous color of the gums and there will be bleeding from gums. If dental plaque is removed and oral hygiene is re-established; the condition is reversible. If left untreated and oral hygiene is not re-established in some people gingivitis can progress to more advanced stage leading to periodontitis. At this stage there will be destruction of supporting structures of teeth like bone and there will be periodontal pocket formation, and loss of attachment. In about 15 percent of cases gingivitis can progress further to severe periodontitis that leads rapidly to tooth loss (FDI. 2015).

2.6. Burden of dental caries and gingivitis among children in India

The burden of tooth decay for 12-year-olds is highest in middle-income countries. The main cause is the rise in sugar consumption. About two-thirds of the tooth decay in these countries remains untreated due to weak oral healthcare systems (FDI. 2015). In India among 6-12 year old children prevalence of dental caries in primary dentition and permanent dentition was 64.2% and 26.6%, respectively (Reddy et al. 2017).

Among 3-12 year old children, in India the prevalence of gingivitis was 41.28% (Nasser et al. 2019). About 32.35% had mild gingivitis, 67.36% had moderate gingivitis, and 0.29% had severe gingivitis. Among 12 year old children the prevalence of gingivitis was 59%, among them 53.09 % children had mild gingivitis 5.5% children had moderate gingivitis and 41.41% had severe gingivitis (Sharva et al. 2014).

2.7. Methods to improve oral health

The methods to improve oral health can be broadly classified into three levels (Jürgensen et al., 2012).

1. Downstream (Curative) efforts. These include steps adopted during the early stages s taken during the later stages of the diseases and also steps taken to prevent the relapse of the disease.

   Example: treatment, rehabilitation, and interventions to prevent relapse.

2. Midstream (Preventive) efforts. It is again classified into primary and secondary prevention methods.

   a. Primary prevention methods include those measures that are undertaken before the disease process begins and they prevent the onset of illness. Primary prevention methods also encourage people not to engage in risky behaviors that may unnecessarily increase their chance of getting the disease.

      Example: Oral health education (OHE) and periodic dental checkup.

   b. Secondary prevention methods include those measures which are done during the early stages of the disease and prevent the disease from getting worse. Secondary-prevention methods also try to modify the risk factors and thereby try to reduce the severity of disease outcome.

      Example: Oral health education (OHE), removal of plaque retention factors, professional removal of dental plaque.

3. Upstream (Health policy) efforts. These include policy level changes directed at entire population. Such interventions require adequate support through tax structures, legal constraints and reimbursement mechanisms for proper execution. Example: National and/or local policy initiatives, legislation, regulation

As discussed earlier oral disease are a major public health problem as they affect a large number of adults and children; also, the treatment costs for oral diseases are high. So, the best way to tackle the burden of oral diseases is to focus on midstream efforts that is to focus on prevention. Oral health education (OHE) is an important preventive measure for improving oral health.

2.8. Oral health education (OHE)

Health education is any combination of learning experiences designed to help individuals and communities improve their health, by increasing their knowledge or influencing their attitudes (WHO. 2020). These learning experiences are designed to facilitate voluntary actions towards achieving health. These actions or behaviors may be on the part of individuals, families, institutions or communities. Health education interventions have been planned for children, parents, policy makers, or health care providers (Nakre & Harikiran. 2013).

Oral health education (OHE) is defined as a learning activity which aims to improve individual's knowledge, attitudes and skills relevant to their oral health (Levine. 2004). The goal of oral health education is to improve knowledge, which may lead to adoption of favorable oral health behaviors that contribute to better oral health. OHE is not only directed at reducing disease and injury to teeth and their supporting structures rather it influences the general health and wellbeing (Prabhu & Joseph. 2017) . World Health Organization emphasizes that OHE is an important component of public health intervention and it should be part of global oral health programs for better oral health outcome.

Oral health education (OHE) can be provided at individual level and at group/community level (Baehni, 2012). Individual level approach is more time consuming. It is usually associated with dental visits of the individual. Here the instruction received by each individual will be modified according to his or her his /her perceived needs, demands, expectations and values. Group level approaches are more cost effective and less time consuming. Here a group of individuals are

involved at the same time. Here along with general information, instructions needed to tackle the problems most prevalent in that community are also provided. OHE approaches at group level can be delivered at schools, the workplace, day care and residential settings for older adults and health care providers etc.

2.9. Oral health education (OHE) interventions for children

The best time to provide oral heal education is childhood; especially 6-12 years. Schools wills be the most effective way to reach out to children. OHE programs could be used as a public health intervention to improve the oral health of children. Many studies which have evaluated the effectiveness of such interventions had reported that OHE interventions had brought positive impacts on oral health status of children, their oral health related knowledge and attitude, but could not effectively change the oral health related behaviors in children.

Childhood is the most influential stage in a person's life. Favorable health related behaviors are established during childhood and there is high chance that these behaviors are sustained throughout adulthood as well (Nalli et al. 2016). According to educational psychologists and specialists children are curious and they could be motivated for new communications and acquiring new skills, so child-hood is the best time for forming attitudes and behaviors. The sooner oral health related behaviors are initiated into life, higher the probability for successful long term maintenance (Prabhu & Joseph. 2017). So oral disease prevention programs should focus on children (Ghaffari et al. 2018). Therefore, OHE interventions will be most effective when delivered at childhood.

The most appropriate time to provide OHE to children is 6-12 years, because it is the time of mixed dentition; first permanent teeth erupts by the age of 6 years. According to Erikson's 8 Stages of Psychosocial Development children in 6-12 years of age group are productive and they learn the pleasure of applying themselves to the task, and feel pride in their

accomplishments (Erikson. 2019). This age group also falls under the concrete operational stage of Piaget's theory. They can attach concepts to concrete thoughts. They acquire and use cognitive operations such as mental activities that are components of logical thought (Suznemeth. 2016).

Worldwide schools have been recognized as an ideal setting for promoting oral health, as they offer an efficient and effective way to reach over children (Prabhu & Joseph. 2017). School based approach has been reported to be more efficient in delivering health education to children than community based approach as it is more cost effective, less time consuming, loss to follow up will be very less.(Nalli et al. 2016).

As discussed earlier in children the major oral diseases are dental caries and gingivitis, and the main etiologic factor causing them is dental plaque. Dental caries and gingivitis can be prevented to large extend by improving oral hygiene status of the children. Oral Health Education (OHE) could be as an important method of public health intervention to improve oral hygiene status, oral health and reduce the burden of oral diseases among children.

Oral health education interventions for children were usually delivered by dental professionals, teachers, anganwadi workers or peers. The oral health education instructions were given as lectures, videos, printed leaflets and brushing technique demonstrations were also used (Gambhir et al. 2013). Interventions which used more than one method of information delivery showed significant improvement in oral health compared to those which used only one method (Menegaz et al. 2018). Many studies have evaluated the effectiveness of such OHE interventions.

Systematic reviews had reported that OHE interventions had brought positive impacts on oral health status of children, their oral health related knowledge and attitude (Ghaffari et al. 2018) (Priya et al. 2019); but their oral health related behavior did not change proportionately (Habbu & Krishnappa. 2015) (Nakre & Harikiran. 2013). Systematic review by Stein et al. reported

that there was no long-term evidence on the effectiveness oral health education interventions in preventing plaque accumulation, gingivitis and dental caries in schoolchildren (Soldani & Wu, 2018), (Stein et al. 2018). To bring about effective changes in behavior and long-term sustainable changes, OHE interventions based on health behavior theories may be needed.

2.10. Need for health behavior theory based school oral health education intervention in children

Health education alone cannot produce desirable changes in health behaviors of the subjects. Among adults OHE health behavior theory based OHE interventions resulted in significant improvement in oral health related behaviors. Among children most of such studies just focused on how behavior impacts health and the consequences of unhealthy behaviors. An ideal oral health behavior change intervention for children should be planned, implemented and evaluated based on structured framework which can be modified according to the context.

Theory is a set of interrelated constructs (concepts), definitions, and, propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting phenomena. Concepts are the major components or building blocks of a theory. Concepts are called constructs when they are developed or adopted for use in a particular theory. Models combine theories to produce an educational frame work for the development of appropriate health education interventions (Glanz. 2008).

Psychosocial factors are the most significant modifiable determinant of behavior. Health education alone does not necessarily lead to desirable changes in health behaviors. A health education intervention will be more beneficial for participants if it is guided by a theory of health behavior. Health behavior theories provide a systematic approach to tailor, target, implement and evaluate health education programs that will enhance the likelihood of success. Improving one's adherence to oral health instructions requires changing his/her oral health

behavior to improve their adherence to oral health instructions. The health behavior theory based approach of OHE interventions will help us to understand the determinants of adherence to recommendations concerning oral health behaviors. Such approaches provides superior outcomes when compared with non-theory based, simple traditional OHE interventions (Sanaei Nasab et al. 2019).

Systematic review by Kay E et al. reported that oral health education interventions based on health behavior theories have resulted in significant improvement in oral hygiene status, gingival health and oral health related practices in adults (Kay et al. 2016). Compared with traditional OHE interventions, OHE interventions based on behavioral theories showed statistically significant improvement in adults with regard to plaque score and oral health related behaviors (Werner et al. 2016).

Analysis of health behavior change interventions for children for preventing dental caries delivered in primary schools by Adair et al. found that none of the studies mentioned the behavior theory they used (Adair et al. 2013). The interventions just focused on how behavior impacts health and the consequences of unhealthy behaviors as well as providing oral hygiene instructions. Adair et al. also reported that an ideal oral health behavior change intervention for children should be planned, implemented and evaluated based on structured framework which can be modified according to the context (Adair et al. 2013). The PRECED-PROCEED is model provides an educational frame work for the development of appropriate health education interventions based on health behavior theories.

2.11. The PRECEDE–PROCEED model as a framework for development of health behavior theory based school oral health education intervention

2.11.1. The PRECED-PROCEED model

The PRECEDE–PROCEED model was developed in two stages. The PRECEDE framework was developed in the 1970s, later in 1991, the PROCEED part was added to the framework, in 2005, PRECEDE-PROCEED was revised again (Glanz. 2008).

The PRECEDE–PROCEED model provides a structure for *applying theories* and concepts systematically for planning, implementing and evaluating health behavior change programs. PRECEDE-PROCEED model can be thought of as a *road map* and behavior change theories as the specific *directions* to a destination. The road map presents all the possible avenues, whereas the theory suggests certain avenues to follow (Glanz. 2008).

The acronym *PRECEDE* stands for Predisposing, Reinforcing, and Enabling Constructs in Educational/Environmental Diagnosis and Evaluation. PRECEDE is based on the premise that, just as medical diagnosis precedes a treatment plan, so should educational diagnosis precede an intervention plan. So, we can consider the first part as an "educational diagnosis". The acronym *PROCEED* stands for Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development. It helps to recognize the importance of environmental factors as determinants of health and health behaviors. So we can consider the second part as an "ecological diagnosis". Thus in this framework, health behavior is regarded as being influenced by both individual and environmental factors (Glanz. 2008).

The PRECEDE–PROCEED model consists of total eight phases. PRECEDE part consists of four planning phases (phase 1- social assessment, phase 2- epidemiological, behavioral and environmental assessment, phase 3- educational and ecological assessment, phase 4-

administrative and policy diagnosis). PROCEED part consists of one implementation phase (phase 5- implementation), and three evaluation phases (phase 6- process evaluation, phase 7- impact evaluation, phase 8- outcome evaluation) (Glanz. 2008).

The PRECEDE–PROCEED model provides a structured framework for applying health behavior theories at various levels (Glans K et al., 2008). Community level theories (Participation and relevance, Community organization, Community mobilization, Organizational change, Diffusion of innovation) can be applied at phase 1, 2, 3 and 4. Interpersonal level theories (Social Cognitive Theory, Adult learning, Interpersonal communication) and individual level theories (Health Belief Model, Stages of Change, Theory of Reasoned Action, Theory of Planned Behavior, Information processing) can be applied at phase 2 and 3.

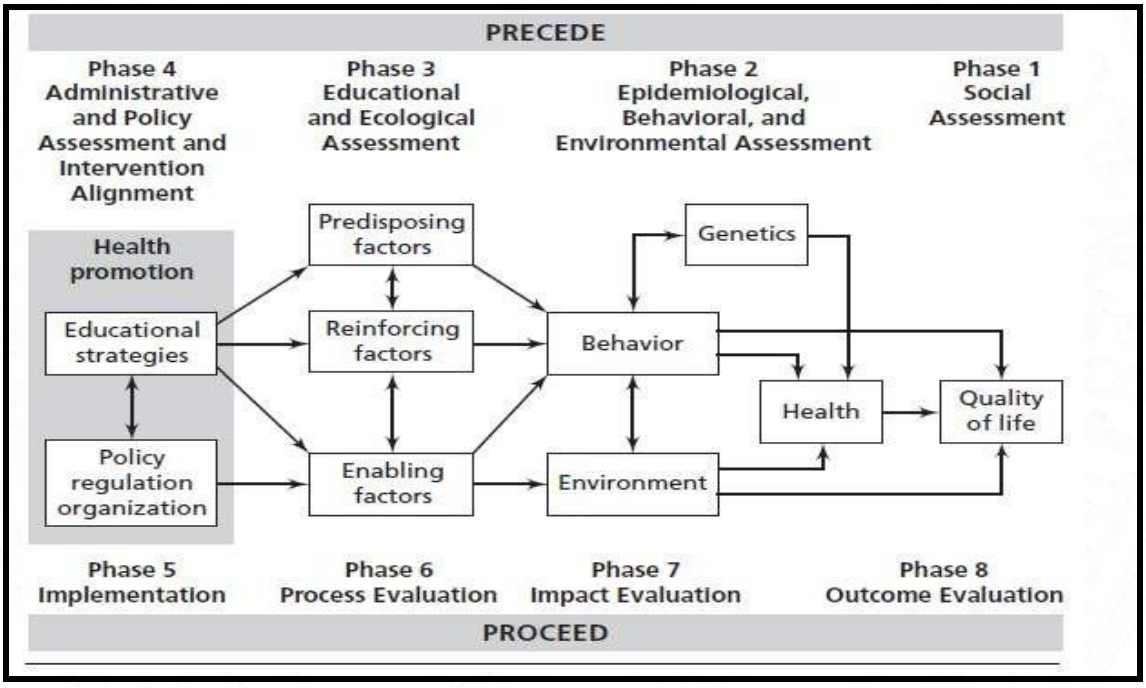


Figure 1: Phases of The PRECEDE–PROCEED model (Adapted from Health behavior and Health education 5th edition)

The fundamental principle of this model is that success in achieving change can be achieved by active participation of the intended audience in defining their own high-priority problems and goals and in developing and implementing solutions. The planning helps us to target the

intervention by choosing those factors that are most important and most changeable. During implementation inputs from the audience and stakeholders can be sought. Finally, measurable objectives are set and specified throughout the process, which helps in evaluation (Glanz. 2008).

Phase 1: Social Assessment, Participatory Planning, and Situation Analysis

At this stage, the program planners try to gain an understanding of the community or the intended audience of the program. They planners attempt to understand the audience's needs, their problem-solving capacity, their strengths, weaknesses, resources and their readiness to change. This is done through various activities such as developing a planning committee, holding community forums, and conducting focus groups discussions, surveys, and/or in depth interviews (Glanz. 2008).

Phase 2: Epidemiological, Behavioral, and Environmental Assessments

In epidemiological assessment the planner tries to identify the health problems and issues the program will focus. It can be done through primary or secondary data analysis. The behavioral determinants are behaviors or lifestyles that contribute to the health problem. The environmental determinants are environmental factors are those social and physical factors external to the individual, often beyond the control of the individual that contribute to the behavior or influence the outcome (Glanz. 2008).

Phase 3: Educational and Ecological Assessment

This phase helps the planners to understand the *predisposing*, *reinforcing*, and *enabling* factors. Predisposing factors are those factors that that provide the rationale or motivation for the behavior. They include an individuals' knowledge, attitudes, beliefs, personal preferences, existing skills, and self-efficacy beliefs. *Reinforcing factors* are those factors that strengthen the motivation for behavior. These factors cause repetition of the behavior. Examples include

social support, peer influence, significant others, and vicarious reinforcement. *Enabling factors* are those factors which enhance behavior. Examples include skill or resource required to attain specific behavior, include programs, services, and resources necessary for behavioral change (Glanz. 2008).

Phase 4: Administrative and Policy Assessment and Intervention Alignment Based on the data from the earlier phases the intervention program will be developed. This phase helps in assessment of resources, development and allocation of budget, looking at organizational barriers, and coordination of the program (Glanz. 2008.).

Phase 5: Implementation of the program

In this phase the program will be implemented as planned (Glanz. 2008).

Phase 6: Process evaluation

This phase determines whether the program is being implemented according to the protocol. It also helps to identify modifications that may be needed to improve the program (Glanz. 2008).

Phase 7: Impact evaluation

This phase measures the effectiveness of the program with regards to the changes in predisposing, enabling, reinforcing factors as well as behavioral and environmental factors (Glanz. 2008).

Phase 8: Outcome evaluation

This phase measures change in terms of overall objectives and determines the effect the program had in the health and quality of life of the participants (Glanz. 2008).

The PRECEDE–PROCEED model would thus be an appropriate framework for planning, implementing and evaluating oral health education intervention for children. Advantages of

this model are that it can be modified according to the context and it provides options for skipping phases when appropriate evidence already exists.

2.11.2. Oral health interventions based on the PRECED-PROCEED model

The PRECEDE–PROCEED model has been used to design many interventions and questionnaires. It has also been used to design oral health related questionnaires and interventions in many parts of the world. In India there is a lack of health behavior theory based school OHE intervention studies based on PRECEDE–PROCEED model.

The PRECEDE–PROCEED model has been used to design interventions for diverse health problems like weight control, nutrition education, tobacco cessation, alcohol and drug abuse prevention, and injury prevention (Glanz. 2008).

Japan Dental Association has developed an adult oral health assessment questionnaire based on the PRECEDE–PROCEED model (Nomura et al. 2019). In Japan the PRECEDE–PROCEED model was also used for developing a questionnaire for parents that looked into the factors that affected oral health behavior and attendance of children at scheduled dental health check-ups (Sato & Oda. 2011). The PRECEDE–PROCEED model was used for developing a questionnaire for nurses who took care of bedridden elders to identify the enablers and barriers that influenced the provision of daily mouth care for those elders (Dharamsi et al. 2009). The PRECEDE-PROCEED model had been used to design questionnaires to study the knowledge, attitude and practice of dentist regarding oral cancer (Cannick et al. 2007) and obstructive sleep apnea (Bian & Smith. 2006)

In United States the PRECEDE–PROCEED model was used for developing and evaluating oral health interventions for adults within intellectual and developmental disabilities (Binkley & Johnson. 2013). The PRECEDE-PROCEED model was used to guide the planning and process evaluation of an oral health community participatory project in Mount Pleasant, an

inner-city Latino neighborhood of Washington, DC. The results showed that the project was useful for addressing oral health problems of a community not reached by traditional oral health care promotion initiatives (Watson et al. 2001). The PRECEDE-PROCEED model was used as the conceptual framework for the development, implementation and evaluation an intervention which aimed to improve swallowing, feeding and oral care technique of medical staff in an orphanage in Guatemala taking care of medically compromised children with special needs. The intervention resulted in significant increase in knowledge and appropriate feeding, positioning and oral care technique of the medical staff (Colodny et al. 2015). In Australia the PRECEDE–PROCEED model was used to develop a school-based preventive oral health program for controlling dental caries in primary school children (Dimitropoulos et al. 2018).

In India there is a lack of health behavior theory based school OHE intervention studies. The PRECEDE–PROCEED model can be used as a framework for development, implementation and evaluation of such health behavior theory based school oral health education intervention studies.

2.12. Justification/Rationale for the study

Oral diseases are a major public health problem for children. The best way to tackle the burden of oral diseases is to focus on prevention. Oral health education (OHE) is an important preventive measure for improving oral health. OHE interventions will be most effective when delivered at childhood because it is the most influential stage in a person's life. The most appropriate time to provide OHE to children is 6-12 years, because it is the time of mixed dentition; and children in this age group are productive and they learn the pleasure of applying themselves to the task. Schools are considered to provide the most favorable environment to impart oral health education to children because they provide an efficient and effective way to reach out to children. OHE intervention could be more beneficial for participants if it is guided by health behavior theories. The PRECEDE–PROCEED model provides an appropriate

framework for planning, implementing and evaluating heath behavior theory based interventions. In India there is a lack of health behavior theory based school OHE intervention studies. The PRECEDE–PROCEED model can be used as a framework for development, implementation and evaluation of health behavior theory based school oral health education intervention studies for 6-12 year old children.

CHAPTER – 3

MTERIALSAND METHOD

3.1. Study type/design

The study was a cluster randomized controlled trial. The study was conducted in three phases. These phases are briefly described below and will be discussed in detail in later sections.

3.1.1. Phases of the study

Phase 1: Development of a school oral health education intervention plan for 6-12 year old children.

In phase 1 steps were taken to gather information to develop the school oral health education intervention program. First Focus group discussions (FGDs) were conducted with parents and teachers of 6-12 year old school children. It was followed by baseline survey and clinical oral examination of 6-12 year old school children. After the baseline survey in depth interviews were conducted with parents of children who showed extremes of oral hygiene status in the baseline clinical oral examination.

The phase 1 of this study was designed in accordance with phase 1 to 4 of the PRECEDE–PROCEED model. Focus group discussions (FGDs) conducted with parents and teachers of 6-12 year old school children was in accordance with the phase 1 of PRECEDE–PROCEED model (Social assessment, Participatory planning and Situation Analysis). Clinical oral exanimation helped to achieve epidemiological assessment part the phase 2 of the PRECEDE–PROCEED model. In depth interviews helped to achieve behavioral and environmental assessment part of the phase 2 of PRECEDE–PROCEED model. The baseline survey helped to achieve the educational and ecological assessment part of the phase 3 of the PRECEDE–PROCEED model. The school oral health education intervention program was developed

based on the information gathered from the FGDs, baseline survey and the in depth interviews. This corresponds to phase 4 (intervention alignment) of the PRECEDE–PROCEED model.

After that the development of the intervention program the 6-12 year old school children were randomly divided into two groups, the intervention group and the control group for implementation of the intervention program which was done in phase 2.

Phase 2: Implementation of the school oral health education intervention for 6-12 year old children

Phase 2 involved the implementation of the school oral health education intervention program developed in phase 1 in the intervention group for 3 months. The intervention group received three sessions of oral health education classes by the dentist at one month apart. This phase was in accordance with phase 5 (implementation phase) of the PRECEDE–PROCEED model.

Phase 3: Evaluation of the effectiveness of the school oral health education intervention program.

In Phase 3 the effectiveness of the school oral health education intervention was evaluated. It involved post intervention survey and clinical oral examination among intervention and control group, followed by FGDs with parents and teachers of children in the intervention group.

This third phase of the study was designed in accordance with phase 6 to 8 of the PRECEDE–PROCEED model. The FGDs with parents and teachers of children in the intervention group helped to achieve the phase 6 (process evaluation) of the PRECEDE–PROCEED model. The post intervention survey was in accordance with phase 7 (impact evaluation) and post intervention clinical oral examination was in accordance with phase 8 (outcome evaluation) of the PRECEDE–PROCEED model.

Due to ethical consideration after post intervention survey and post intervention clinical oral examination, the children in the control group received one session of OHE class and the oral health education materials developed during the program.

Table 1: Phases of the study

Phases		Methodology
1	Development of a school oral health education intervention plan for 6-12 year old children	• Focus group discussions (FGDs) with parents and teachers of 6-12 year old school children • Baseline survey and clinical oral examination among 6-12 year old school children • In depth interviews with parents of children who showed extremes of oral hygiene status in the baseline clinical oral examination.
	The school oral health education intervention program was developed based on the information gathered from the FGDs, baseline survey and in depth interviews. After that, the intervention group and the control group were formed (Process explained in detail in sample selection procedure, section 3.4).	
2	Implementation of the school oral health education intervention for 6-12 year old children	• The school oral health education intervention program developed in phase 1 was implemented in the intervention group for 3 months. The intervention group received three sessions of oral health education classes by the dentist at one month apart.
3	Evaluation of the effectiveness of the school oral health education intervention	• Post intervention survey and clinical oral examination among intervention and control group. • Focus group discussions with parents and teachers of 6-12 year old school children in the intervention group.

3.2.Study setting

Thiruvananthapuram district in Kerala state is divided into three educational districts; which are Neyyattinkara, Thiruvananthapuram and Attingal (General Education Department. 2019).

In both Neyyattinkara and Attingal educational district, more than 95% of the students study in rural schools. In Thiruvananthapuram educational district 43% of students study in urban schools and 57% of students study in rural schools. In order to get an adequate representation of children studying in both urban and rural schools, the study was conducted in schools coming under Thiruvananthapuram educational district. Since 6-12 year old children study in standards one to seven, this study involved children studying in first to seventh standards of government or government aided schools coming under Thiruvananthapuram educational district. The parents and teachers of these children were also be involved in this study.

3.3.Sample size

The sample size was calculated based on the major objective. The sample size for the intervention phase was calculated using the formula

$$n = \frac{2\,[(\alpha + \beta)^2\,\sigma^2]}{(\mu 1 - \mu 2)^2}$$ (Noordzij et al., 2010)

where

n= the sample size in each of the groups

$\mu 1$ = population mean in intervention group

$\mu 2$ = population mean in control group

$\mu 1 - \mu 2$= the difference the investigator wishes to detect

σ^2= population variance (SD)

At 5% level of significance (α =1.96) and assuming 80% power (β = 0.842), based on a previous study (Chandrashekar et al. 2014) expecting a difference ($\mu 1 - \mu 2$) of 0.36 in the mean oral hygiene index – simplified score (measure of oral hygiene status) and population variance (σ^2) of 0.9 the sample was calculated.

$$n = \frac{2\,[(\alpha + \beta)^2\,\sigma^2]}{(\mu 1 - \mu 2)^2}$$

$$= \frac{2[(1.96+0.842)^2\ 0.9^2}{0.36^2}$$

$$\sim 98$$

Since this was a cluster sampling design, a design effect of 2 was assumed. Thus the sample size becomes 196 (n=98x2 = 196). Assuming a 13% loss to follow up the sample size was calculated as 225 per group [n = (196x100/87=225)]. Therefore 225 children needed to be included in both intervention group and control group. That was a total of 450 school children aged 6-12 year needed to be included in the study.

3.4.Sample selection procedure

The study involved 6-12 year old children in standards one to seven studying in schools which met the inclusion criteria set for selecting the schools. The parents and teachers of these children were also involved in this study.

The inclusion criteria set for schools were as follows.

- It should be a school for general education
- It should be a co-education (mixed) school
- It should be a government or government aided school
- It should contain standards one to seven (since 6-12 year old children study in these standards)
- It should have at least 10 students studying in all standards from one to seven

In Thiruvananthapuram educational district there were 27 schools which met these inclusion criteria. Multi stage cluster sampling was used.

In Thiruvananthapuram educational district there were 27 schools which met the inclusion criteria which were set for the schools. Multi stage cluster sampling was used. In the first stage schools were selected and in the second stage class divisions were selected. Class divisions were the clusters. Children in age group 6-12 years study in first to seventh standard. Total strength of all class divisions in the 27 schools which meet the inclusion criteria from standard one to seven was 11468 (2016-2017 data) and the total number of class divisions in these schools in standards one to seven was 397. Total strength of all class divisions from standard one to seven in the 27 schools were divided by total number of class divisions in standard one to seven in those schools and the average cluster size was calculated by dividing the total strength by the total number of class divisions (11468/397).; it was 29. In order to the obtain sample size of 225 per group 7.7 (225/29) clusters had to be selected per group; so eight clusters per group were selected. To get best possible representation of the eligible schools, from one school only one class division was selected. In the total strength of all class divisions from standard one to seven in the 27 schools 43% was from urban schools and 57% were from rural schools. So in each group three class divisions were selected from urban schools and five class divisions were selected from rural schools. Total six urban schools and 10 rural schools were involved in the study, so there was 16 schools in total.

In the phase 1 of the study focus group discussions (FGDs) were conducted with parents and teachers of children in the selected class divisions. It was followed by baseline survey and clinical oral examination of those children. It was followed by in depth interviews with the parents of the children who showed extremes of oral hygiene status in the baseline clinical oral examination. The school oral health education intervention program was developed based on the information gathered from the FGDs, baseline survey and in depth interviews. After the development of school OHE program the six urban class divisions were randomly divided into 2 groups and 10 rural class divisions were randomly divided into 2 groups; one group was the intervention group and the other were the control group. Thus, the intervention group had 3

urban class divisions and 5 rural class divisions. Similarly, the control group also had 3 urban class divisions and 5 rural class divisions.

In phase 2 the intervention group received three sessions of oral health education classes by the dentist at one month apart. The control group did not receive any OHE class in the implementation phase. In phase 3 post intervention survey and clinical oral examination were conducted among children in both intervention and control group. After that the children in the control group also received one session of OHE class by the dentist and the educational materials developed during the study. It was followed by FGDs with parent and teachers of children in the intervention group.

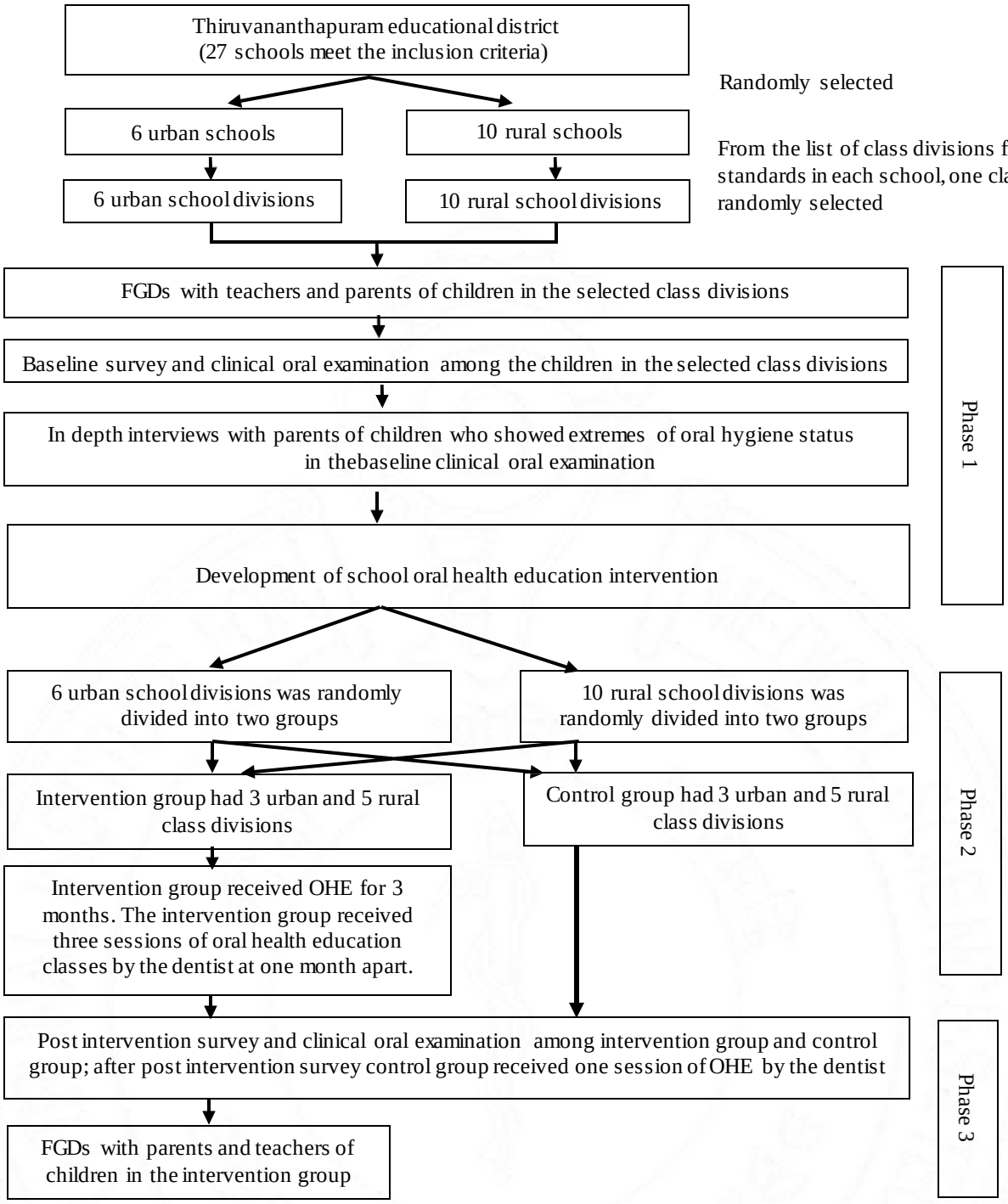


Figure 2: Flow chart showing sample selection

3.5.Data collection techniques

The data collection techniques used in various phases of the study are described below.

3.5.1.Phase 1: Development of a school oral health education intervention plan for 6-12 year old children.

In phase 1 steps were taken to gather information to develop the school oral health education intervention program. First Focus group discussions (FGDs) were conducted with parents and teachers of 6-12 year old school children. It was followed by baseline survey and clinical oral examination of 6-12 year old school children. After the baseline survey in depth interviews were conducted with parents of children who showed extremes of oral health status in the baseline survey and clinical oral examination.

3.5.1.1. Focus groups discussions (FGDs)

First Focus group discussions (FGDs) were conducted with parents and teachers of 6-12 year old school children. Focus group discussions (FGDs) conducted with parents and teachers of 6-12 year old school children was in accordance with the phase 1 of PRECEDE–PROCEED model (Social assessment, Participatory planning and Situation Analysis).

FGDs were conducted based on the principles of participation and relevance an example of community level theory. According to this principle those who are affected by a decision have a right to be involved in the decision-making process. Community participation implies that their contributions are relevant and would influence the decision making (Griffiths. 1959). Here we got to understand the oral hygiene habits and related situations of 6-12 year old children by gathering

information directly from their parents and teachers. FGDs were conducted till saturation occurred. The sampling was purposive. Six FGDs were conducted among 42 teachers. Among them 36 participants were females and six participants were males, with a mean age of 36 and 27 years respectively. Eight FGDs were conducted among 40 parents. Among them 35 participants were females and five participants were males, with a mean age of 32 and 39 years respectively.

FGDs with teachers and parents was conducted based on respective FGD guidelines. [FGD guidelines for teachers - English version (Appendix 4i), Malayalam version (Appendix 4ii); FGD guidelines for parents - English version (Appendix 5i), Malayalam version (Appendix 5ii)]. The moderator of the FGDs was the principal investigator and there was an assistant to take down the notes. The number of participants in each FGDs ranged from eight to twelve. The FGDs were audiotaped and recorded with permission of the participants. The FGDs with teachers were conducted in staff rooms or vacant class rooms. The FGDs with parents were conducted in vacant class rooms or meeting halls of the schools.

FGDs with teachers and parents were conducted to understand the oral hygiene habits of children, dietary habits of children, common dental problems seen in children, absenteeism of children from school due to oral health problems, nearby available dental care services, dental visits of children etc. We also tried to find out the teachers' and parents' expectations regarding OHE class for children, their willingness to be part of the program, and their opinion regarding the usefulness of brushing chart etc.

In the FGDs with teachers we also explored whether oral hygiene practices or oral health had been a part of school syllabus, suitable time and methods to conduct classes, available facilities in their

schools like free periods, class rooms, plug points etc. In the FGDs with parents we explored regarding the idea of using mobile phones to reach out to them.

3.5.1.2. Baseline Survey

FGDs were followed by baseline survey and clinical oral examination of 6-12 year old school children. The baseline survey helped to achieve the educational and ecological assessment part of the phase 3 of the PRECEDE– PROCEED model.

Expecting a dental caries prevalence of 77% based on a previous study by Christian (Christian.2019); at a 95% confidence interval and assuming a design effect of 1.5 the sample size was calculated as 409. Assuming a 13.55 non-response rate the final sample size was calculated was 465. A cross sectional survey was conducted among 465 children.

Base line survey was conducted by data collector using a pretested structured interview schedule [English version (Appendix 6i), Malayalam version (Appendix 6ii)]. It was used to assess the oral health related knowledge, attitude and practices of the 6 – 12 year old children. It had 5 sections.

First section (Section A) was on general information of the children like their name, address, parents' names, school details, contact details etc. Second section (Section B) dealt with socio demographic information of the children like age, sex, religion, parents' occupation, etc.

The third section (Section C) dealt with oral heath related knowledge of the children. This section we tried to find out their sources of information regarding teeth, their knowledge on the etiology, symptoms, and methods of prevention of dental caries and gingivitis. In this section we also tried

to find their knowledge regarding the harmfulness of tobacco, effect of oral health on general health etc.

The fourth section (Section D) dealt with oral health related attitude of the children. Here we tried to find out whether children thought that brushing teeth was important, what they would do if they had tooth pain or if they had bleeding from gums and whether they thought regular dental checkup was necessary for oral health etc.

Fifth section (Section E) dealt with oral health related practices of children. Here we tried to find out the teeth cleaning habits of children like whether they cleaned their teeth daily, who cleaned their teeth, how they cleaned their teeth, frequency of brushing teeth, whether they cleaned their tongue, how they cleaned their tongue, whether they cleaned their mouth after each meals etc. We also tried to find out how often they ate sweets and drank soft drinks, their frequency of dental visits, reason for dental visits, reason for not visiting dentists.

Lastly, we also tried to find out whether children had tobacco using habits and whether children had missed school days due to oral health problems.

3.5.1.3. Clinical oral examination

Clinical oral exanimation helped to achieve epidemiological assessment part the phase 2 of the PRECEDE–PROCEED model.

In the clinical oral examination part the oral hygiene status of the children, gingival status of the children and dental caries status of children were recorded (Appendix 7) by the principal investigator

3.5.1.3.1. Simplified Oral Hygiene Index (OHI-S).

Oral hygiene status of the children were recorded using Simplified Oral Hygiene Index (OHI-S). This index was developed in 1964 by John C. Greene and Jack R. Vermillion (Peter. 2003). Six tooth surfaces were scored.

3.5.1.3.1.1. Selection of tooth surfaces

The six surfaces examined for the OHI-S were selected from four posterior and two anterior teeth. If a designated tooth was not a fully erupted permanent tooth or has a full crown restoration or has surfaces reduced in height by caries or trauma, a substitution was done. OHI-S score was recorded if at least two of the index teeth or their substitute were present.

In the posterior portion of the dentition, the first fully erupted tooth distal to the second bicuspid, usually the first molar is examined. Sometimes the second molar was used a substitute for first molar. The buccal surfaces of the selected upper molars (16, 26) and the lingual surfaces of the selected lower molars (36, 46) were inspected.

In the anterior portion of the mouth, the labial surfaces of the upper right (11) and the lower left central incisors (31) were scored. In the absence of either of this anterior tooth, the central incisor (21 or 41 respectively) on the opposite side of the midline was substituted.

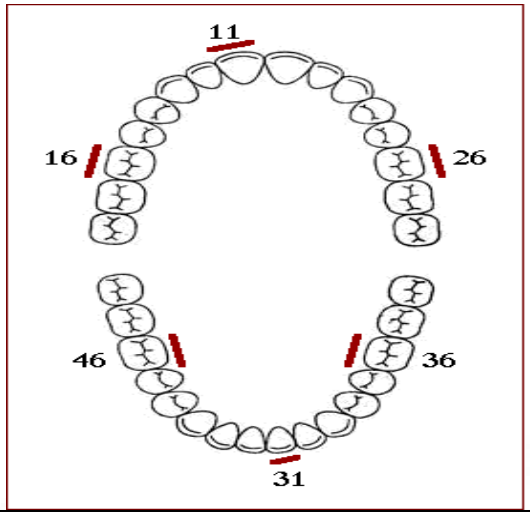


Figure 3: Simplified Oral Hygiene Index – selection of tooth surfaces

The OHI-S, has two components, the Debris Index and the Calculus Index. Each of these in dexes, in turn, is based on numerical determinations representing the amount of debris or calculus found on the pre-selected tooth surfaces.

3.5.1.3.1.2. The Debris Index- Simplified (DI-S)

Debris Index was recorded first recorded. Debris is soft and contains mucin, bacteria and food varying in color from grayish white to green or grange.

The DI-S score was estimated by running the side of a sterilized stainless-steel dental explorer (No 23) along the buccal/labial and lingual surfaces and noted the occlusal or incisal extent of the debris as it is was removed from the tooth surface. The cheeks/lips and tongue were retracted by a sterile stainless-steel moth mirror (Figure 4). Illumination was provided by a head light.

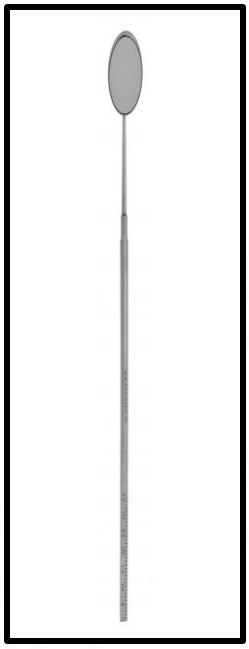


Figure 4: A – Mouth mirror B- Dental Explorer

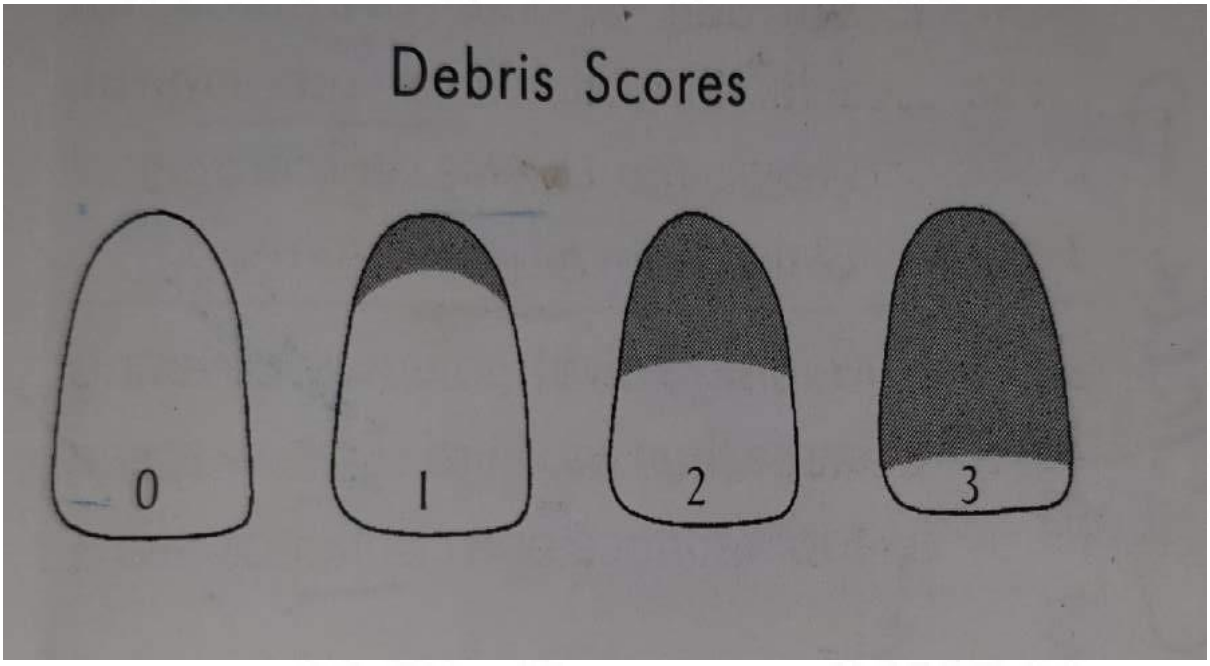


Figure 5: Debris Score

Table 2: The Debris Index- Simplified (DI-S) Scores

Score	Criteria
0	No debris or stains present
1	Soft debris covering not more than one third of the tooth surface, or the presence of extrinsic stains without other debris regardless of surface area covered
2	Soft debris covering more than one third, but not more than two thirds, of the exposed tooth surface
3	Soft debris covering more than two thirds of the exposed tooth surface

$$\text{Debris Index – Simplified (DI-S)} = \frac{\text{Total debris score recorded}}{\text{Total number of tooth surfaces scored}}$$

3.5.1.3.1.3. The Calculus Index – Simplified (CI-S)

Calculus is mineralized plaque. It consists of calcium carbonate and phosphate mixed with food debris, bacteria, and desquamated epithelium cells. Supra gingival calculus is located at or occlusal the level of free gingival margin. It is usually white to yellowish-brown in color. Subgingival calculus is located apical to the free gingival margin. It is usually light brown to black in color.

The CI-S score was estimated by running the side of a sterilized stainless-steel dental explorer (No 23) along the buccal/labial and lingual surfaces and the occlusal or incisal extent of the calculus was noted. The cheeks/lips and tongue were retracted by a sterile stainless-steel moth mirror (Figure 4). Illumination was provided by a head light.

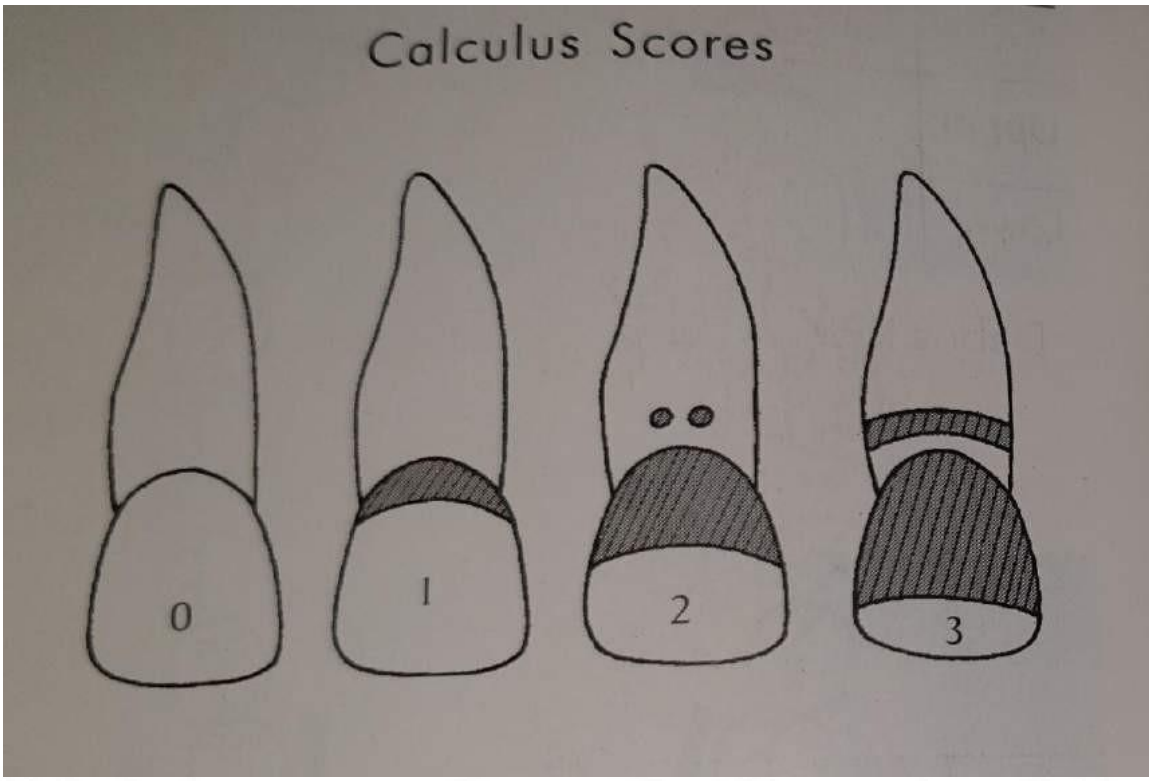


Figure 6: Calculus Score

Table 3: The Calculus Index- Simplified (CI-S) Scores

Score	**Criteria**
0	No calculus present
1	Supragingival calculus covering not more than one third of the exposed tooth surface
2	Supragingival calculus covering more than one third, but not more than two thirds of the exposed tooth surface or the presence of individual flecks of subgingival calculus around the cervical portion of the tooth or both
3	Supragingival calculus covering more than two third of the exposed tooth surface or a continuous heavy band of subgingival calculus around the cervical portion of the tooth or both

$$\text{Calculus Index – Simplified(CI-S)} = \frac{\text{Total calculus score recorded}}{\text{Total number of tooth surfaces scored}}$$

The Debris Index-Simplified (DI-S) and Calculus Index-Simplified (CI-S) values range from 0 to 3, which can be interpreted as given in table 4.

Table 4: Interpretation of the Debris Index-Simplified (DI-S) and the Calculus Index-Simplified (CI-S) value range

Interpretation	DI-S/CI-S score value range
Good	0.0 to 0.6
Fair	0.7 to 1.8
Poor	1.9 to 3.0

3.5.1.3.1.4. Calculation of Oral Hygiene Index – Simplified (OHI-S)

Once the Debris Index-Simplified (DI-S) and Calculus Index-Simplified (CI-S) were calculated separately, then they were added together to get the Oral Hygiene Index-Simplified [OHI-S] score.

$$\text{Oral Hygiene Index – Simplified (OHI-S)} = \text{Debris Index – Simplified (DI-S)} + \text{Calculus Index – Simplified (CI-S)}$$

The Oral Hygiene Index-Simplified [OHI-S] value ranges from 0 to 6, which can be interpreted as given in table 5.

Table 5: Interpretation of the Oral Hygiene Index-Simplified (OHI-S) value range

Interpretation	OHI-S score value range
Good	0.0 to 1.2
Fair	1.3 to 3.0
Poor	3.1 to 6.0

3.5.1.3.2. Gingival Index (GI)

The gingival status of the children was recorded using Gingival Index (GI) This index was developed by Loe H and Silness J in 1963. This index assesses severity of gingivitis and its location in four possible areas by examining only qualitative changes, of gingival soft tissue (Peter. 2003).

3.5.1.3.2.1. Selection of tooth surfaces

Six index teeth of gingival index were maxillary right first molar (16), maxillary left lateral incisor (12), maxillary left first premolar (24), mandibular left first molar (36), mandibular left lateral incisor (32) and mandibular right first premolar (44). GI score was recorded if at least two of the index teeth were present.

3.5.1.3.2.2. Procedure of recording gingival index (GI)

The cheeks/lips and tongue were retracted by a sterile stainless-steel moth mirror (Figure 4). Illumination was provided by a head light. Teeth and gingiva were dried lightly with a of cotton

rolls before recording gingival index (GI). Tissues surrounding each tooth were divided into four gingival scoring units: distal-facial papilla, facial margin, mesial-facial papilla and the entire lingual gingival margin. A sterile stainless-steel periodontal probe (Figure 7) was used to assess bleeding potential of the tissues and the score was assigned.

Figure 7: Periodontal probe

Table 6: The Gingival Index (GI) Scores

Score	Criteria
0	Absence of inflammation/normal gingiva
1	Mild inflammation, slight change in color, slight edema; no bleeding onprobing
2	Moderate inflammation; moderate glazing, redness, edema and hypertrophy. Bleeding on probing.
3	Severe inflammation; marked redness and hypertrophy ulceration. Tendency for spontaneous bleeding

3.5.1.3.2.3. Calculation of Gingival index[GI]

Scores around each tooth are added and divided by four to obtain gingival index score for the tooth. Adding of all of scores per tooth and dividing by number of teeth examined provides gingival index score per person. The gingival index value ranges from 0.1 to 3, which can be interpreted as varying degrees of clinical gingivitis as given in table 7.

Table 7: Interpretation of the Gingival Index (GI) value range

GI score value range	Condition
0.1 to 1.0	Mild Gingivitis
1.1 to 2.0	Moderate Gingivitis
2.1 to 3.0	Severe Gingivitis

The children in this study were in mixed dentition period; they had both permanent teeth and deciduous teeth. Dental caries status of the permanent teeth was recorded using Decayed-Missing-Filled Teeth Index (DMFT index) and that of deciduous teeth were recorded using Decayed-extracted-filled teeth Index (def index).

3.5.1.3.3. Decayed-Missing-Filled Teeth (DMFT) Index

Decayed-Missing-Filled Teeth (DMFT) Index was developed by Henry T. Klein, Carrole E.

Palmer and Knutson J W in 1983. This index was developed based on the fact that dental hard tissues are not self-healing and dental caries once formed leaves a scar of some sort. The tooth either remains decayed, or if treated it would be extracted of filled. The DMFT index is therefore an irreversible index, meaning that it measures total life time caries experience (Peter, 2003).

D – used to describe decayed teeth

M – used to describe missing teeth due to caries

F – used to describe teeth that have been previously filled.

3.5.1.3.3.1. Procedure of recording Decayed-Missing-Filled Teeth (DMFT) Index

The cheeks/lips and tongue were retracted by a sterile stainless-steel moth mirror. Illumination was provided by a head light. A sterile stainless-steel dental explorer (No 23) tip was used to determine the presence of caries (Figure 4).

3.5.1.3.3.1.1. The Criteria used for identification of dental caries

1. If the lesion was clinically visible and obvious
2. If the dental explorer tip penetrated deep into the soft yielding material
3. If there was discoloration or loss of translucency of enamel typical of undermined or demineralized enamel.
4. If the dental explorer tip in a pit or fissure resisted the removal after moderate to firm pressure on insertion and when there was softness at the base of the area.

3.5.1.3.3.2. Rules followed while recording Decayed-Missing-Filled Teeth (DMFT) Index

1. Status of all tooth were recoded.
2. The teeth that were not included were
   - Unerupted teeth and partially erupted teeth. A tooth was considered to be erupted when the occlusal or incisal edge was totally exposed or could be exposed by gently reflecting the overlying gingival tissues with the mouth mirror or dental explorer.
   - Congenitally missing and supernumerary teeth
   - Teeth removed for reasons other than dental caries like orthodontic treatment.
   - Teeth restored for reasons other than dental caries such as trauma (fracture)
3. No tooth was counted more than once. It was either decayed, missing, filled or sound. Decayed, missing and filled teeth were recorded separately.
4. If a restored tooth had decay, it was counted as decayed.
5. Even if a tooth had many restorations, it was counted as one.
6. Grossly decayed teeth and roots stumps indicated for extractions were recorded as missing.

3.5.1.3.3.3. Calculation of Decayed-Missing-Filled Teeth (DMFT) Index

Decayed, missing and filled teeth were recorded separately. Each component was totaled separately and then added together the total DMFT score of an individual child was obtained.

Total DMFT score of an individual = Total number of decayed teeth (DT) + total number of missing teeth due to caries (MT) + total number of filled teeth (FT)

3.5.1.3.4. Decayed-extracted-filled teeth (def) index

The 'def index' was developed by Gruebbel A.O. in 1944 as an equivalent index to DMFT index for measuring dental caries status in deciduous dentition. As discussed earlier dental hard tissues are not self-healing and dental caries once formed leaves a scar of some sort. The tooth either remains decayed, or if treated it would be extracted of filled. The def index is also an irreversible index (Peter. 2003).

d – used to describe decayed teeth

e– used to describe teeth extracted due to caries

f – used to describe teeth that have been previously filled.

3.5.1.3.4.1. Procedure of recording Decayed-extracted-filled teeth Index (def) index.

The cheeks/lips and tongue were retracted by a sterile stainless-steel moth mirror. Illumination was provided by a head light. A sterile stainless-steel dental explorer (No 23) tip was used to determine the presence of caries (Figure 4).

3.5.1.3.4.1.1. The Criteria used for identification of dental caries

1. If the lesion was clinically visible and obvious
2. If the dental explorer tip penetrated deep into the soft yielding material
3. If there was discoloration or loss of translucency of enamel typical of undermined or demineralized enamel.
4. If the dental explorer tip in a pit or fissure resisted the removal after moderate to firm pressure on insertion and when there was softness at the base of the area.

3.5.1.3.4.2. Rules followed while recording Decayed-extracted-filled teeth Index (def) index.

1. Status of all tooth were recoded.
2. The teeth that were not included were
   - Congenitally missing and supernumerary teeth
   - Teeth restored for reasons other than dental caries such as trauma (fracture)
3. No tooth was counted more than once. It was either decayed, extracted, filled or sound or naturally exfoliated. Careful history was taken to find out whether a missing tooth was extracted due to caries or was exfoliated naturally. Decayed, extracted and filled teeth were recorded separately.
4. If a restored tooth had decay, it was counted as decayed.
5. Even if a tooth had many restorations, it was counted as one.
6. Grossly decayed teeth and roots stumps indicated for extractions were recorded as missing.

3.5.1.3.4.3. Calculation of Decayed-extracted-filled teeth Index (def) index.

Decayed, extracted and filled teeth were recorded separately. Each component was totaled separately and then added together the total def score of an individual child was obtained.

Total def score of an individual = Total number of decayed teeth (dt) + total number of extracted teeth due to caries (et) + total number of filled teeth (ft)

3.5.1.4. In depth interviews

After the baseline survey and clinical oral examination in depth interviews were conducted with parents of children who showed extremes of oral hygiene status in the baseline clinical oral examination. In depth interviews were conducted with parents of children whose baseline OHI-S score were either below 0.20 or above 4.5. In depth interviews helped to achieve behavioral and environmental assessment part of the phase 2 of PRECEDE–PROCEED model.

IDIs were guided by theory of planned behavior an example of individual level theory. According to this theory behavior is determined by intention to perform behavior. Intention to perform behavior in turn depends on attitude, subjective norm and perceived control. External constraints also have effect on final behavior. In this study we also used descriptive norm to get a wider perspective (Glanz. 2008).

Attitude is an individual's emotional response to the idea of performing a recommended behavior. That means attitude deals with an individual's feelings and beliefs about idea of performing a behavior. A person who strongly beliefs that positive outcomes will occur after performing a behavior said to have a positive attitude towards that behavior. Similarly, a person who strongly beliefs that negative outcomes will occur after performing a behavior is said to have a negative attitude towards that behavior.

Subjective norm or injunctive norm refers to an individual's belief about what others (important person or group of people) think one should do or will approve and support regarding a particular behavior. Since subjective norm did not fully capture normative influence, in this study we also took into consideration descriptive norm that is an individual's perceptions about what others in

his/her social or personal networks are doing which could also influence their behavior. Perceived control, is one's perceived amount of control over behavioral performance, even when various environmental factors make it easy versus difficult to carry out the behavior. Perceived control is determined by facilitators and barriers to behavioral performance.

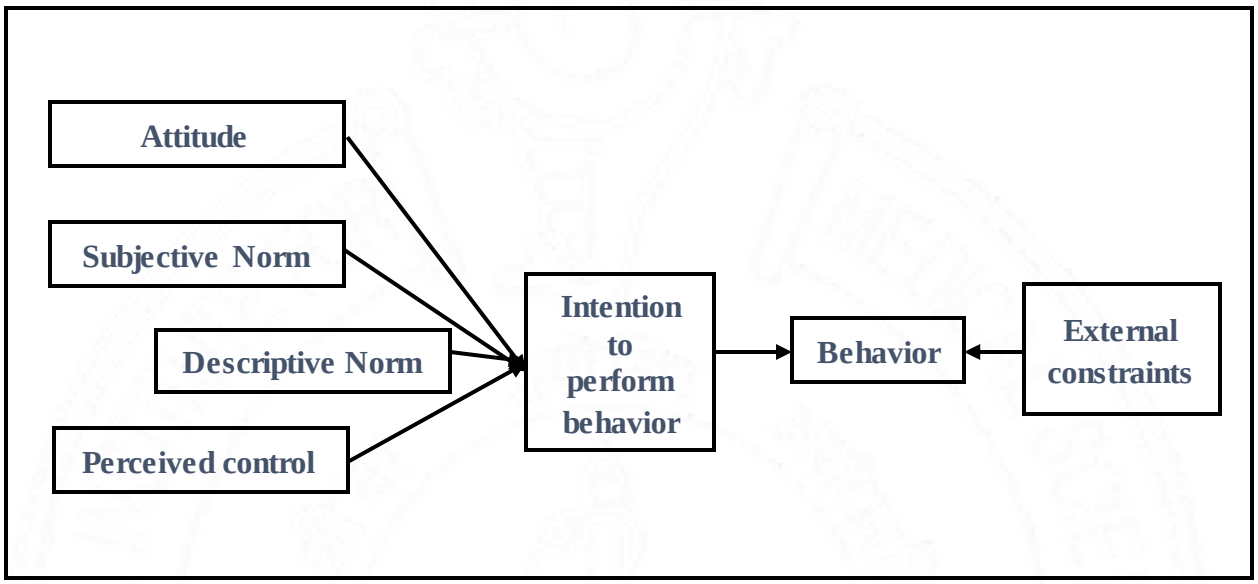


Figure 8: Theory of planned behavior (modification) Adapted from Health behavior and Health education 5th edition

IDIs with parents was conducted based on IDI guidelines. [English version (Appendix 8i), Malayalam version (Appendix 8ii)]. The interviewer was the principal investigator. The IDIs were audiotaped and recorded with permission of the participants. The principal investigator took down notes whenever needed. Some of the IDIs were conducted in vacant class rooms. Some parents had difficulty in coming to schools for participating in IDIs due to time constrains; for them the IDs were conducted at their homes at a time suitable for them.

IDIs with parents were conducted to understand the oral hygiene habits of children, dietary habits of children, their oral hygiene instructions to their children, and whether they have they noticed

tobacco use by their children. We also tried to find out how they taught tooth brushing to their children, nearby dental care services available, dental visits of children, difficulties and challenges they faced in maintaining the oral health of their children. In the IDIs we also explored regarding the common oral health complaints, oral hygiene practices, dental visits and tobacco use among parents and other the family members of the children.

3.5.1.5. Development of intervention program

The school oral health education intervention program was developed based on the information gathered from the FGDs, baseline survey and in-depth interviews. This corresponds to phase 4 (Intervention alignment) of the PRECEDE–PROCEED model.

The development of the school oral health education intervention program was guided by health belief model. Since the targeted audience for our intervention was 6-12 year old children we used a relatively simple theory like health belief model to guide the development of our intervention. According to this theory if individuals regard themselves as susceptible to a condition, believe that condition would have potentially serious consequences, believe that a course of action available to them would be beneficial in reducing either their susceptibility to or severity of the condition, and believe the anticipated benefits of taking action outweigh the barriers to (or costs of) action, they are likely to take action that they believe will reduce their risks (Glanz. 2008).

Table 8: Key Concepts and Definitions of the Health Belief Model (Glanz. 2008)

Concept	Definition	**Action**
Perceived susceptibility	Belief about the likelihood of experiencing a risk or getting a condition or disease	Personalize risk based on a person's characteristics or unhealthy behavior
Perceived severity	Belief about how serious a condition become if left untreated that is its clinical and social sequelae	Specify consequences of risks and conditions
Perceived benefits	Belief in efficacy of the advised action to reduce risk	Define action to take: how, where, when; clarify the positive effects to be expected
Perceived barriers	Belief about the tangible and psychological costs of the advised action	Identify and reduce perceived barriers through reassurance, correction of misinformation, incentives, assistance
Cues to action	Strategies to activate "readiness"	Promote awareness, use appropriate reminder systems
Self-efficacy	Confidence in one's ability to take action	Provide training and guidance in performing

3.5.1.5.1. Intervention program

A 20 minutes oral health education video was developed. Topics included were importance of teeth; importance of deciduous teeth; causes, symptoms, sequelae and prevention of dental caries and gum diseases; how oral health is related to general health; dietary habits good for oral health;

dietary habits bad for oral health; importance of twice daily tooth cleaning with tooth brush and tooth paste; importance of morning tooth brushing after breakfast; tooth brushing technique, detrimental effects of tooth cleaning with materials like charcoal, salt, pepper, tooth powder; when to change tooth brush; how much tooth paste to be taken; tongue cleaning technique; importance of washing mouth after meals and snacks; what to do and what not to do if you experience tooth pain or bleeding from gums; importance of reduced intake of sweets, packed food items, packet juices and soft drinks; harmful effects of tobacco; importance of regular dental checkups every six months. All these topics were covered in a simple manner with the help of cartoons and pictures in the video. Video had an attractive background music to retain attention of the children.

Charts and pamphlets were developed displaying the brushing technique, the shedding time of deciduous teeth, the erupting schedule of permanent teeth and covering all the main points coming under the topics included in the video. A total of four charts and one pamphlet were developed. Monthly brushing charts were developed as a reminder brushing. It had boxes to put tick mark after tooth brushing during morning and at night.

The process of development of intervention program had been described later in detail in the results section 4.3.2. (Page 152). After the development of intervention program, the intervention group and the control group were formed.

3.5.2. Phase 2: Implementation of the school oral health education intervention for 6-12 year old children

Phase 2 of the study involved the implementation of the school oral health education intervention program in the intervention group for 3 months. This phase was in accordance with phase 5 (implementation phase) of the PRECEDE–PROCEED model.

Only decision regarding the intervention which was decided prior to the start of the study was that the intervention group would receive three sessions of oral health education classes by the dentist at one month apart. During this phase children in the control group neither received any OHE class nor the OHE materials.

3.5.2.1. The Oral health education classes

The oral health education classes were taken by the dentist (principal investigator) in the local language Malayalam, with the help of the 20 minutes video developed. The classes were taken during the second period of the school day in smart class rooms where the videos were shown using projectors. All the topics especially the new topics were explained in a simple manner with examples way so that children could understand the topic and they could accept the new information. The children were encouraged to ask doubts. During the classes it was made sure that teachers or other school authorities were not present so that children do not feel shy to open up and ask their doubts in front of them. Any doubt raised by the children were cleared then and there itself.

After the class the children were divided into four to five groups and each group were demonstrated the modified bass tooth brushing technique and tongue cleaning technique by a dentist with help of the tooth brushing model and a tooth brush. After that each child was given a chance to do the brushing technique and the tongue cleaning technique on the tooth brushing model. Children's doubts regarding the tooth brushing technique and tongue cleaning techniques were cleared there itself. The oral health education classes including demonstration and practice of tooth brushing and tongue cleaning techniques were repeated at one month apart for 3 months.

3.5.2.2. The Oral health education materials

The copies of the four charts were pasted on the class rooms. The charts which included the main points of all the topics which were covered in the OHE class reminded the children regarding the main points of oral health education class. The chart illustrating the brushing technique reminded them regarding how to brush their teeth. The fourth chart gave information to children regarding the shedding time of their deciduous teeth and eruption time of their permanent teeth.

Copies of the pamphlet were taken and distributed among the children. Children were requested to take the pamphlets to their parents and family members. Pamphlets were also distributed to the teachers and staff in the school; especially class teachers of the children and all other teachers taking classes for the children. Through pamphlets we could inform the parents and teachers regarding the main points of all the topics which were covered in the oral health education classes, the correct method of tooth brushing, the shedding time of deciduous teeth and eruption time of permanent teeth.

Monthly brushing charts were distributed among the children after every OHE class. Each child received of total of three brushing charts over a period of three months. Monthly brushing charts were used to remind the children regarding twice daily tooth brushing. It was clearly explained to the children how they have to make use of the brushing chart. The children were informed that they had to put tick mark in the boxes after they did tooth brushing during morning and at night. Children were also informed that they should not put tick marks on the boxes without doing tooth brushing. Children were asked to bring back their monthly brushing chart at the end of every month and show it to their class teachers. Children were also informed that their teachers would check

their brushing charts and teachers would give their comments and those who had brushed twice daily for the whole month would additionally get a 'Star' mark on their chart.

3.5.2.3. Role of class teachers

Class teachers were happy to be a part of the intervention program. As per our request during the regular school days the class teachers reminded and encouraged the children to brush twice daily. At the end of every month after the OHE class children were asked to bring back their monthly brushing chart and show it to their class teachers. As per our request the class teachers checked the brushing charts. Our instructions for the teachers were that if the children had used the brushing chart effectively and marked tick marks the teacher would appreciate the children and write "Good" comment in their chart as a measure of appreciation. If the children had brushed twice daily for the whole month the teacher would additionally give a 'Star' mark on their chart as a measure of encouragement for continuing their behavior like that. The appreciation and encouragement from teachers' side acted as positive reinforcement for children to continue twice daily tooth brushing.

During the OHE implementation phase children in the control group neither received any OHE class nor the OHE materials.

3.5.3. Phase 3: Evaluation of the effectiveness of the school oral health education intervention program

In Phase 3 the effectiveness of the school oral health education intervention was evaluated. It

involved post intervention survey and clinical oral examination among intervention and control group, followed by FGDs with parents and teachers of children in the intervention group.

3.5.3.1. Post intervention survey

The post intervention survey was conducted among children in both intervention and control group. The post intervention survey was in accordance with phase 7 (impact evaluation) of the PRECEDE–PROCEED model.

Post intervention survey was conducted by data collector using a structured interview schedule [English version (Appendix 9i), Malayalam version (Appendix 9ii)] similar to that used in the baseline survey but with some modifications. It was used to assess the oral health related knowledge, attitude and practices of the 6 – 12 year old children after the intervention phase. It had 4 sections.

First section (Section A) was on general information of the children; like their name, address, contact details etc.

Second section (Section B) dealt with oral heath related knowledge of the children. This section we tried to find out their knowledge on the etiology, symptoms, and methods of prevention of dental caries and gingivitis. In this section we also tried to find their knowledge regarding the harmfulness of tobacco, effect of oral health on general health etc.

The third section (Section C) dealt with oral health related attitude of the children. Here we tried to find out whether children thought that brushing teeth was important, what they would do if they had tooth pain or if they had bleeding from gums and whether they thought regular dental checkup was necessary for oral health etc.

Fourth section (Section D) dealt with oral health related practices of children. Here we tried to find out the teeth cleaning habits of children like whether they cleaned their teeth daily, who cleaned their teeth, how they cleaned their teeth, frequency of brushing teeth, whether they cleaned their tongue, how they cleaned their tongue, whether they cleaned their mouth after each meals etc. We also tried to find out how often they ate sweets and drank soft drinks, whether they visited the dentist during last three months, reason for dental visits, and if not the reason for not visiting dentists.

Lastly, we also tried to find out whether children had tobacco using habits and whether children had missed school days due to oral health problems in last three months.

3.5.3.2. Post intervention clinical oral examination

The post intervention clinical oral examination was conducted among children in both intervention and control group. The post intervention clinical oral examination was in accordance with phase 8 (outcome evaluation) of the PRECEDE–PROCEED model.

In the clinical oral examination part, the oral hygiene status of the children, gingival status of the children and dental caries status of children after the intervention phase were recorded (Appendix

7) by the principal investigator.

Oral hygiene status of the children was recorded using Simplified Oral Hygiene Index (OHI-S). The gingival status of the children was recorded using Gingival Index (GI). Dental caries status of the permanent teeth was recorded using Decayed-Missing-Filled Teeth Index (DMFT index) and that of deciduous teeth were recorded using Decayed-extracted-filled teeth Index (def index). These indices were recorded in a similar way as it was done during the baseline clinical oral examination of the children. The details of these indices and the method in which they were recorded have been explained earlier in the clinical oral examination part of phase 1.

3.5.3.3. OHE class for the control group

Due to ethical consideration, after the post intervention survey and post intervention clinical oral examination in phase 3, the children in the control group received one session of OHE class including demonstration and practice of tooth brushing and tongue cleaning techniques. The control group children also received the OHE materials developed as part of the intervention program. The charts were pasted in their class rooms. Brushing charts and pamphlets were distributed among the children, they were requested to take the pamphlets to their parents. Pamphlets were also distributed among their teachers.

3.5.3.4. Focus group discussions (FGDs)

The FGDs were conducted with parents and teachers of children in the intervention group. Those FGDs helped to achieve the phase 6 (process evaluation) of the PRECEDE–PROCEED model.

FGDs were conducted based on the principles of participation and relevance an example of community level theory. According to this principle those who were affected by a decision have a right to be involved in the decision-making process. Community participation implies that their contributions were relevant and would influence the decision making (Griffiths. 1959). Here we tried to understand regarding the usefulness of the OHE program for 6-12 year old children by gathering information directly from their parents and teachers. We also tried to find the suggestions for the improvement of the program.

FGDs were conducted till saturation occurred. The sampling was purposive. Three FGDs were conducted among 26 teachers. Among them 20 participants were females and six participants were males, with a mean age of 35 and 27 years respectively. Four FGDs were conducted among 22 parents. Among them 20 participants were females and two participants were males, with a mean age of 31 and 37 years respectively.

FGDs with teachers and parents was conducted based on respective FGD guidelines [FGD guidelines for teachers - English version (Appendix 10i), Malayalam version (Appendix 10ii); FGD guidelines for parents - English version (Appendix 11i), Malayalam version (Appendix 11ii)]. The moderator of the FGDs was the principal investigator and there was an assistant to take down the notes. The number of participants in each FGDs ranged from eight to twelve. The FGDs were audiotaped and recorded with permission of the participants. The FGDs with teachers were conducted in staff rooms or vacant class rooms. The FGDs with parents were conducted in vacant class rooms or meeting halls of the schools.

In the FGDs with teachers and parents we explored regarding the experience children shared with them regarding the OHE program, changes they had noticed in the oral hygiene habits of the

children during the intervention period, usefulness of OHE materials like pamphlets and monthly brushing chart. We also tried to understand their take on the OHE program, their suggestions for improving the program and their opinion regarding the need for such OHE intervention programs in future.

3.6.Data Analysis.

3.6.1.Quantitative data analysis

Quantitative data came from baseline and post intervention survey and clinical oral examination. Quantitative data analysis was done using Statistical Package for Social Sciences SPSS version17.

Quantitative data analysis mainly helped to achieve the objectives of the study. First baseline analysis of the data was done. The baseline analysis also helped us to calculate the prevalence of dental caries (minor objective 1) and the prevalence of gingivitis (minor objective 2). The information from the baseline analysis was also used to develop the intervention program. In the second stage of analysis was baseline comparison of intervention group and the control group to find out whether the two groups were similar to each other at the baseline. The third stage of analysis was post intervention comparison of the intervention group and the control group to find out the effectiveness of the intervention program. The analysis in this stage helped to find the effect of the OHE intervention on the oral health status of 6-12 year old children (major objective), on the prevalence of gingivitis of 6-12 year old children (minor objective 3) and on the oral health related knowledge, attitude and practices of 6-12 year old children (minor objective 4). The statistical tests used would be the Pearson Chi square test, the Independent sample T test, and the MacNemar test and the model used would be the linear regression model.

3.6.2.Qualitative data analysis

Qualitative data came from phase 1 and phase 3. In phase 1 FGDs with parents and teachers and IDIs with parents were conducted. In phase 3 FGDs with parents and teachers were conducted.

The FGDs and IDIS were conducted in local language (Malayalam). They were audio taped and recorded and important points were noted down. Those recording and the important points noted were first transcribed into the same local language Malayalam, then later translated into English. The data were code manually and themes were identified. Qualitative data from phase 1 helped in development of the intervention program. Qualitative data from phase 3 helped in process evaluation of the intervention program.

3.7.Ethical consideration

The proposed study complied with all the basic ethical principles of research. The study got approval and clearance from the Institutional Ethics Committee (IEC) of Sree Chitra Tirunal Institute for Medical Sciences and Technology (Appendix 1). Written permission from the Additional Director of Public Instruction, Kerala (Appendix 2) and the Deputy Director of Education Thiruvananthapuram had been obtained (Appendix 3). The study was registered in the Clinical Trials Registry –India (CTRI-NIMS). The trial registration number is CTRI/2018/01/011493 and reference number is REF/2018/01/016755.

Information regarding the study was explained to the participants. Participant information sheet written in local language (Malayalam) containing information regarding the study, objectives, potential benefits and risk of participating in the study and giving the freedom of choice to the participants to either participate in the study or not was given to the study participants before the start of every phase of the study. Participant information regarding post intervention survey and

clinical oral examination of phase 3 was shared along the information on implementation of intervention phase 2.

1. Phase 1
    1. Participant information sheet for teachers for conducting FGDs with them [English version (Appendix 12i), Malayalam version (Appendix 12ii)]
    2. Participant information sheet for parents for conducting FGDs with them [English version (Appendix 14i), Malayalam version (Appendix 14ii)]
    3. Participant information sheet for parents for conducting baseline survey and clinical oral examination among their children [English version (Appendix 16i), Malayalam version (Appendix 16ii)]
    4. Participant information sheet for children for conducting baseline survey and clinical oral examination with them [English version (Appendix 18i), Malayalam version (Appendix 18ii)]
    5. Participant information sheet for parents for conducting IDIs with them [English version (Appendix 20i), Malayalam version (Appendix 20ii)]
2. Phase 2
    1. Participant information sheet for parents for implementation of OHE intervention program among their children and for post intervention survey and clinical oral examination [English version (Appendix 22i), Malayalam version (Appendix 22ii)]
    2. Participant information sheet for children for implementation of OHE intervention program among them and for post intervention survey and clinical oral examination [English version (Appendix 24i), Malayalam version (Appendix 24ii)]

3. Phase 3

    1. Participant information sheet for teachers for conducting FGDs with them [English version (Appendix 26i), Malayalam version (Appendix 26ii)]
    2. Participant information sheet for parents for conducting FGDs with them [English version (Appendix 28i), Malayalam version (Appendix 28ii)]

In each phase written informed consent in local language (Malayalam) was obtained from the participants. In case of children written informed assent in local language (Malayalam) was be taken from them along with written informed consent in local language (Malayalam) from a parent/competent family member. The assent from the children and the consent from their parent/competent family member for the post intervention survey and clinical oral examination for phase 3 was obtained along with that for the implementation of the intervention of phase 2.

1. Phase 1

    1. FGDs with teachers – consent form [English version (Appendix 13i), Malayalam version (Appendix 13ii)]
    2. FGDs with parents – consent form [English version (Appendix 15i), Malayalam version (Appendix 15ii)]
    3. Baseline survey and clinical oral examination among children – consent form for parents [English version (Appendix 17i), Malayalam version (Appendix 17ii)]
    4. Baseline survey and clinical oral examination among children –assent form for children [English version (Appendix 19i), Malayalam version (Appendix 19ii)]
    5. IDIs with parents – consent form [English version (Appendix 21i), Malayalam version (Appendix 21ii)]

2. Phase 2
    1. Implementation of OHE intervention program, post intervention survey and clinical oral examination – consent form for parents [English version (Appendix 23i), Malayalam version (Appendix 23ii)]
    2. Implementation of OHE intervention program, post intervention survey and clinical oral examination – assent form for children [English version (Appendix 25i), Malayalam version (Appendix 25ii)]
3. Phase 3
    1. FGDs with teachers – consent form [English version (Appendix 27i), Malayalam version (Appendix 27ii)]
    2. FGDs with parents – consent form [English version (Appendix 29i), Malayalam version (Appendix 29ii)]

Confidentiality and participants' right to withdraw from the study was be maintained throughout the study. Adequate biosafety precautions will be ensured. After post intervention survey children in the control group will received one session of oral health education class by the dentist and the educational materials developed during the study.

CHAPTER – 4

RESULTS

4.1. Sequence of presentation of results

The results are present in the following sequence. First the results of the quantitative data analysis are presented followed by the results of the qualitative data analysis.

4.1.1. Quantitative data

As mentioned earlier in the data analysis section quantitative data came from baseline and post intervention survey and clinical oral examination. Results from the quantitative data analysis mainly helped to achieve the objectives of the study and they are presented in the following sequence.

1. Baseline analysis of the data.
    - The results at this stage gave us
        - the prevalence of dental caries among 6-12 year old children (minor objective 1)
        - the prevalence of gingivitis among 6-12 year old children (minor objective 2).
        - the epidemiological assessment
        - the predisposing, reinforcing, and enabling factors (the Educational and Ecological Assessment)
    - The results from this stage was used along with results of the qualitative data analysis of phase 1 to develop the intervention program.

2. Baseline comparison of intervention group and the control group.
    - The results at this stage showed whether the two groups were similar to each other at the baseline.
3. Post intervention comparison of the intervention group and the control group
    - The results at this stage showed the effect of the OHE intervention
        - on the oral hygiene status of 6-12 year old children (major objective)
        - on the gingival health status of 6-12 year old children
        - on the prevalence of gingivitis of 6-12 year old children (minor objective 3)
        - on the oral health related knowledge, attitude and practices of 6-12 year old children (minor objective 4).
        - on the dental caries status of 6-12 year old children
    - The results from this stage helped to find out the impact evaluation and outcome evaluation of the OHE intervention program

4.1.2. Qualitative data

Qualitative data in this study came from phase 1 and phase 3. In phase 1 qualitative data were obtained from the FGDs with parents and teachers and from the IDIs with the parents. In phase 3 qualitative data came from the FGDs conducted with parents and teachers. The Results of the qualitative data analysis are presented in the following sequence.

1. Phase 1
    - FGDs with teachers of 6-12 year old children
    - FGDs with parents of 6-12 year old children

- IDIs with parents of children who showed extremes of oral hygiene status in the baseline clinical oral examination.
- Behavioral and environmental assessment

2. Intervention development
    - Based on results of the baseline data analysis of quantitative data and the results of the analysis of qualitative data from phase 1.
3. Phase 3
    - FGDs with teachers of children in the intervention group
    - FGDS with parents of children in the intervention group
    - The results from this stage helped to find out the process evaluation of the OHE intervention program

4.2. Results of the quantitative data analysis

4.2.1. Baseline data analysis

The baseline data came from the base line survey and clinical oral examination which were conducted among 465 children.

4.2.1.1. General information

All the children were from government schools. 57% of children were from rural schools and the rest (43%) were from urban schools. 51% of children studied in English medium schools and the rest (49%) in Malayalam medium schools.

4.2.1.2. Socio demographic information

The age of the children ranged from 8 to 13 years. The mean age of the children was 10.43±.92 years. About 58.7% of the children were boys and rest of them were girls (41.3%). Majority of the children were Hindus (66.9%) and rest of them were Muslims (30.1%) and Christians (3%). Most of the children belonged to other backward caste (OBC) (62.6%) (Table 9).

Table 9: Baseline distribution of children according to caste

Baseline distribution of children according to caste		
Caste	Frequency (N)	Percent (%)
General	98	21.1
Other backward caste (OBC)	291	62.6
Scheduled caste (SC)	73	15.7
Scheduled tribe (ST)	3	0.6
Total	465	100

Majority of the father were daily wage workers (71.4%); only 8.4% had government job (Table 10). Most of the mothers were unemployed (58.3%), some were daily wage workers (29%) and only a very few were employed in the government sector (3.7%) (Table 10). Majority of the children lived in their own houses (81.7%) and the rest (18.3%) in rented houses. About 61.9% of children lived in concrete roofed houses, while 21.3 % of them livened in houses with tiled roof (Table 11).

Table 10: Baseline distribution of children according to their parent's occupation

Baseline distribution of children according to their parent's occupation				
	Father's occupation		Mother's occupation	
	Frequency (N)	Percent (%)	Frequency (N)	Percent (%)
No Job	6	1.3	271	58.3
Daily Wage Worker	332	71.4	135	29
Agriculture	9	1.9	6	1.3
Private employee	79	17	36	7.7
Government employee	39	8.4	17	3.7
Total	465	100	465	100

Table 11: Baseline distribution of children according to roof of their house

Baseline distribution of children according to roof of their house		
Roof of house	Frequency (N)	Percent (%)
Thatched	9	1.9
Sheets	41	8.8
Tiles	127	27.3
Concrete	288	61.9
Total	465	100

The socio-economic status of the children was estimated based on their father's occupation, mother's occupation, ownership of their house and the roofing of their house. About 60.2 % of them belonged to low socio-economic status, rest of them belonged to medium (16.3%) and high socio-economic status (23.4%).

4.2.1.3. Baseline dental caries status of children

4.2.1.3.1. Baseline dental caries status of deciduous teeth

The baseline decayed extracted filled (def) teeth index score of the children ranged from 0 to 8. The mean def index score of children was 1.24±1.658.

4.2.1.3.2. Baseline dental caries status of permanent teeth

The baseline decayed missing filled teeth (DMFT) index score of the children ranged from 0 to 6. The mean DMFT index score of children was 0.74±1.201.

4.2.1.3.3. Prevalence of dental caries

The prevalence of dental caries among the children was 67.1%. The prevalence of dental caries in deciduous dentition of the children was 52.25% and the prevalence of dental caries in permanent dentition of the children was 37.2% (Table 12). About 22.4% of children had dental caries in both deciduous and permanent dentition.

Table 12: Prevalence of dental caries among 6-12 year old children in Thiruvananthapuram educational district

Prevalence of dental caries among 6-12 year old children in Thiruvananthapuram educational district	
	Prevalence
Prevalence of dental caries	67.1 % (62.73 - 71.26%)
Prevalence of dental caries in the deciduous dentition	52.25% (47.71-56.78%)
Prevalence of dental caries in the permanent dentition	37.2% (32.90 – 41.67%)

4.2.1.4. Baseline gingival health status of children

4.2.1.4.1. Baseline gingival index (GI) score of the children

The baseline gingival index (GI) score of the children ranged from 0 to 2.66. The mean GI score of children was 0.778±0.452.

4.2.1.4.2. Prevalence of gingivitis

The proportion of children with various severity of gingivitis was calculated depending on the grading of their gingival index score as given in table 7. About 98.9% of children had some form of gingivitis while rest of them had normal gingival status. The prevalence of mild gingivitis was 73.11% and that of moderate gingivitis was 24.9%. Severe gingivitis was prevalent in 0.86%of children (Table 13).

Table 13: Prevalence of gingivitis among 6-12 year old children in Thiruvananthapuram educational district

Prevalence of gingivitis among 6-12 year old children in Thiruvananthapuram educational district	
	Prevalence
Prevalence of mild gingivitis	73.11% (69.09 – 77.15%)
Prevalence of moderate gingivitis	24.9% (21.17 – 29.03%)
Prevalence of severe gingivitis	0.86% (0.23 – 2.18%)

4.2.1.5. Baseline oral hygiene status of children

4.2.1.5.1. Baseline oral hygiene index – simplified (OHI-S) score of the children

The baseline oral hygiene index- simplified (OHI-S) score of the children ranged from 0.12 to 5. The mean OHI-S score of children was 2.009±0.8758.

The proportion of children with various sorts of oral hygiene status was calculated depending on the grading of their OHI-S score as mentioned in table 5. Only 20% of children had good oral hygiene status. About 70.8% of children had fair oral hygiene status and about 9.2% of the children had poor oral hygiene status.

4.2.1.6. Oral health related knowledge of children

4.2.1.6.1.Source of oral health related information

Children had multiple sources of oral health related information. They were parents, teachers, television advertisements, books, radio, and friends. The most common source of information of oral health related information for children were their parents (Table 14).

Table 14: Source of oral health related information for children

Source of oral health related information for children			
Source of information		Frequency (N)	Percent (%)
Parents	Yes	331	71.2
	No	134	28.8
	Total	465	100
Teachers	Yes	131	28.2
	No	334	71.8
	Total	465	100
Books	Yes	44	9.5
	No	421	90.5
	Total	465	100
Radio	Yes	18	3.9
	No	447	96.1
	Total	465	100
Television advertisements	Yes	128	27.5
	No	337	72.5
	Total	465	100
Friends	Yes	455	97.8
	No	10	2.2
	Total	465	100

4.2.1.6.2. Knowledge regarding dental caries

Even though more than 95 % of children were aware that sweets cause dental caries (Table 15); only 70% of them were able to identify the correct symptom (tooth ache) of dental caries (Table 16). About 90% of children knew that by proper tooth brushing they could prevent dental caries (Table 17).

Table 15: Baseline oral health related knowledge of children regarding cariogenic food

Baseline oral health related knowledge of children regarding cariogenic food		
Food items	Frequency (N)	Percent (%)
Sweets	446	95.9
Fruits	5	1.1
Vegetables	7	1.5
Don't know	7	1.5
Total	465	100

Table 16: Baseline oral health related knowledge of children regarding symptoms of dental caries

Baseline oral health related knowledge of children regarding symptoms of dental caries		
Symptoms	Frequency (N)	Percent (%)
Bleeding from gums	114	24.5
Tooth ache	324	69.7
Don't know	27	5.8
Total	465	100

Table 17: Baseline oral health related knowledge of children regarding methods of prevention of dental caries

Baseline oral health related knowledge of children regarding methods of prevention of dental caries		
Methods	Frequency (N)	Percent (%)
Proper tooth brushing	419	90.1
Eating more sweets	22	4.7
Don't know	24	5.2
Total	465	100

4.2.1.6.3. Knowledge regarding gum disease

About 56.6 % of children had no idea regarding the symptoms of gum disease; only 24.7% could identify "bleeding from gums" as the correct symptom of gum disease (Table 18). Similarly, about 57% of children had no idea how to prevent gum diseases (Table 19).

Table 18: Baseline oral health related knowledge of children regarding symptoms of gum disease

Baseline oral health related knowledge of children regarding symptoms of gum disease		
Symptoms	Frequency (N)	Percent (%)
Bleeding from gums	115	24.7
Tooth ache	87	18.7
Don't know	263	56.6
Total	465	100

Table 19: Baseline oral health related knowledge of children regarding methods of prevention of gum disease

Baseline oral health related knowledge of children regarding methods of prevention of gum disease		
Methods	Frequency (N)	Percent (%)
Proper tooth brushing	187	40.2
Eating more sweets	11	2.4
Don't know	267	57.4
Total	465	100

4.2.1.6.4. General knowledge regarding oral health

About 79% of children could identify tobacco products as substances harmful to oral health (Table 20). Only 39.8% of children were aware of the fact that oral health and general health are related rest 26% of thought that oral health and general health were not related while the remaining 34.2% of them had no idea about whether oral health and general health were related.

Table 20: Baseline knowledge of children regarding substances harmful for oral health

Baseline knowledge of children regarding substances harmful for oral health		
Substances	Frequency (N)	Percent (%)
Tobacco products	368	79.1
Fruits	7	1.5
Vegetables	9	1.9
Don't know	81	17.4
Total	465	100

4.2.1.6.5. Baseline oral health related knowledge status

The oral health related knowledge status of the children was assessed using the oral health related knowledge (OHRK) score which was calculated based on the children's knowledge regarding etiology, symptoms, and method of prevention of dental caries; the knowledge regarding symptoms and method of prevention of gum disease and the knowledge regarding whether oral health and general health were related. The maximum score possible was 7 and the minimum score possible was zero. The baseline oral health related knowledge (OHRK) score of the children ranged from 0 to 7. The mean OHRK score of children was 4.39±1.35.

4.2.1.7. Oral health related attitude of children

Almost 99% of children felt that there was a need to clean their teeth. About 56% of the children felt that need regular dental checkup was needed, while 35.1% of them felt that that regular dental checkup was not needed and the remaining 8.2% of them did not know whether regular dental checkup was needed or not.

Only 57.4 % of children responded positively to the option of visiting a dentist if they experienced tooth pain. About 7.3% of children responded yes to the option that they would take medication without visiting a dentist if they experienced tooth pain and 4.3% of the children responded yes to the option that they would place eucalyptus oil on the tooth if they felt tooth pain (Table 21).

Only 32 % of children responded positively to the option of visiting a dentist if they experienced bleeding from gums. About 23.4% of children responded yes to the option don't know what to do if they experienced bleeding (Table 22).

Table 21: Baseline attitude of children if they experienced tooth pain

Baseline attitude of children if they experienced tooth pain			
Children's response		Frequency (N)	Percent (%)
Visit doctor	Yes	23	95.1
	No	442	4.9
	Total	465	100
Visit dentist	Yes	267	57.4
	No	198	42.6
	Total	465	100
Ignore pain	Yes	3	0.6
	No	462	99.4
	Total	465	100
Do salt water gargle	Yes	175	37.6
	No	290	62.4
	Total	465	100
Stop brushing teeth	Yes	2	0.4
	No	463	99.6
	Total	465	100
Take medication without visiting dentist	Yes	34	7.3
	No	431	92.7
	Total	465	100
Brush teeth	Yes	31	6.7
	No	434	93.3
	Total	465	100
Wash with ice water	Yes	9	1.9
	No	456	98.1
	Total	465	100
Place eucalyptus oil	Yes	20	4.3
	No	445	95.7
	Total	465	100
Don't know what to do	Yes	11	2.4
	No	254	97.6
	Total	465	100

Table 22: Baseline attitude of children if they experienced bleeding from gums

Baseline attitude of children if they experienced tooth ache			
Children's response		Frequency (N)	Percent (%)
Visit doctor	Yes	20	4.3
	No	445	95.7
	Total	465	100
Visit dentist	Yes	149	32
	No	316	68
	Total	465	100
Ignore bleeding	Yes	3	0.6
	No	462	99.4
	Total	465	100
Do salt water gargle	Yes	147	31.6
	No	318	68.4
	Total	465	100
Stop brushing teeth	Yes	6	1.3
	No	459	98.7
	Total	465	100
Brush teeth	Yes	12	2.6
	No	453	97.4
	Total	465	100
Wash with ice water	Yes	17	3.7
	No	448	96.3
	Total	465	100
Wash with water	Yes	29	6.2
	No	436	93.8
	Total	465	100
Don't know what to do	Yes	108	23.2
	No	357	76.8
	Total	465	100

4.2.1.7.1. Baseline oral health related attitude status

The oral health related attitude status of the children was assessed using the oral health related attitude (OHRA) score which was calculated based on the children's attitude regarding the need for cleaning their teeth, their attitude towards the need for regular dental visit, their attitude if they experienced tooth pain and their attitude if they experienced bleeding from their gums. The maximum score possible was 4 and the minimum score possible was zero. The baseline oral health related attitude (OHRA) score of the children ranged from 0 to 4. The mean OHRA score of children was 2.452±1.012.

4.2.1.8. Oral health related practices of children

4.2.1.8.1. Teeth cleaning practices of children

About 98.7% of the children cleaned their teeth daily and the rest 1.3 % of them also cleaned their teeth daily, but rarely they cleaned their teeth once in two days. So put together almost all the children cleaned their teeth daily.

About 97.8 % of children cleaned their teeth by themselves (Table 23). Children used a variety of materials for cleaning their teeth. All children used tooth brush to clean their teeth in combination with another material. The most common combination was tooth brush and tooth paste (62.6%). About 15.3 % of the children used charcoal occasionally with tooth brush and tooth paste to clean their teeth and 15.3% of children used charcoal regularly along with tooth brush and tooth paste (Table 24).

Table 23: Baseline distribution of children according to who cleaned their teeth

Baseline distribution of children according to who cleaned their teeth		
Who cleaned the children's teeth	Frequency (N)	Percent (%)
Children themselves	455	97.8
Mother	8	1.7
Grand father	1	0.2
Child with the help of others	1	0.2
Total	465	100

Table 24: Baseline distribution of children according to the substances they used to clean their teeth

Baseline distribution of children according to the substances they used to cleaned their teeth		
Substances used by children to clean their teeth	Frequency (N)	Percent (%)
Tooth paste and tooth brush	292	62.8
Tooth brush and tooth powder	3	0.6
Finger and tooth powder	0	0
Tooth paste, tooth brush and occasionally charcoal	71	15.3
Tooth paste, tooth brush and charcoal	71	15.3
Tooth paste, tooth brush and occasionally tooth powder	14	3
Tooth paste, tooth brush and tooth powder	13	2.8
Tooth paste, tooth brush, salt and mango leaf	1	2
Total	465	100

About 45% of children brushed their teeth once daily, 53.1% of them brushed their teeth two times daily and 1.9% of them brushed their teeth more than two times daily. So put together all the children brushed their at least once daily and about 55% of them brushed their teeth at least two times daily.

All the children brushed their teeth in the morning, among them 99.1 % of the children brushed their teeth before breakfast and 0.9% of the children brushed their teeth after the breakfast. About 55% of the children brushed their teeth at night (Table 25).

Among the children who did not brush their teeth twice daily, majority (66%) of them did not brush their teeth twice daily because of their forgetfulness, while 15% of them did not brush their teeth twice daily because of lack of time and the rest 19% of them did not brush their teeth twice daily because of laziness.

Table 25: Baseline distribution of children according to when they brushed their teeth

Baseline distribution of children according to when they brushed their teeth			
Time of brushing		Frequency (N)	Percent (%)
Morning before breakfast	Yes	461	99.1
	No	4	0.9
	Total	465	100
Morning after breakfast	Yes	4	0.9
	No	461	99.1
	Total	465	100
Night before going to bed	Yes	256	55.1
	No	209	44.9
	Total	465	100

Only 13.3% of children followed up and down method of tooth rushing, while 64.9% of them followed side wise method of tooth brushing and the rest (21.7%) of them followed circular method of tooth brushing. About 22.4% of the children changed their tooth brush once in three months and 26.9% of them changed their tooth brush once in a month. So put together only 49.3% of children changed their tooth brush in three or less than three months (Table 26).

Table 26: Baseline distribution of children according to the frequency in which they changed their tooth brush

Baseline distribution of children according to the frequency in which they changed their tooth brush		
Frequency of tooth brush changing	Frequency (N)	Percent (%)
Once in 1 month	125	26.9
Once in 3 months	104	22.4
Once in 6 months	148	31.8
More than 6 months	9	1.9
When the bristles wear off	79	17
Total	465	100

4.2.1.8.2. Tongue cleaning practices of children

About 91.2% of children cleaned their tongue and the rest did not clean their tongue. Among those children who cleaned their tongue, only 4% of the children used tooth brush to clean their tongue while 78.5% of them used tongue cleaner to clean their tongue and the rest (17.5%) of them used midrib of coconut leaf to clean their tongue.

4.2.1.8.3. Oral hygiene practices after taking food

About 99.6 % of children always washed their mouth after taking food and the rest 0.4 % of the children did not always wash their mouth after taking food because of lack of time.

4.2.1.8.4. Dietary habits of children

About 48.2 % children ate sweets once in a week while 15.3% of them ate sweets daily (Table 27). About 47.5% of children had never drank any soft drinks while 38.7% of them drank soft drinks once in a week (Table 28).

Table 27: Baseline distribution of children according to the frequency of their sweet consumption

Baseline distribution of children according to the frequency of their sweet consumption		
Frequency of sweet consumption	Frequency (N)	Percent (%)
Daily	71	15.3
Once in 2-3 days	114	24.5
Once in a week	224	48.2
Once in a month	56	12
Total	465	100

Table 28: Baseline distribution of children according to the frequency of their soft drink consumption

Baseline distribution of children according to the frequency of their soft drink consumption		
Frequency of soft drink consumption	Frequency (N)	Percent (%)
Never	221	47.5
Daily	3	0.6
Once in 2-3 days	5	1.1
Once in a week	180	38.7
Once in a month	56	12
Total	465	100

4.2.1.8.5. Dental visits of children

Only 55.7% children had visited a dentist and the rest (44.3%) of them had never visited a dentist. Among those children who had visited dentist, 6.2% of them made their last dental visit in less than one month and 15.8% of them made their last dental visit in less than six months. So put together only 22% of them had visited dentist in last six months. Rest 78% of the children made their last dental visit before six months.

Among those children who had visited dentist, only 1.5% of them made their last dental visit for regular dental checkup (Table 29).

Table 29: Baseline distribution of children according to the reason for their last dental visit

Baseline distribution of children according to the reason for their last dental visit		
Reason for last dental visit	Frequency (N)	Percent (%)
Regular dental checkup	4	1.5
Tooth pain	143	55.2
Bleeding from gums	8	3.1
Dental caries	65	25.1
Mal positioned teeth	18	6.9
Extraction of teeth	13	5
Fractured teeth	2	0.8
Deposits on teeth	3	1.2
Missing/un erupted teeth	1	0.4
Don't remember	2	0.8
Total	259*	100
*Total number of children who had visited dentist		

Among those children who never visited a dentist, about 64.7% did so because they thought had no dental problems. About 30.9% of the children never visited a dentist because of fear the rest (4.4%) the children never visited a dentist because their parents never took them to a dentist.

Among those children who never visited a dentist because of fear, 60.32% of them feared tooth extraction while the rest (30.7%) of them had the fear of injection needle.

4.2.1.8.6. Tobacco use among children

Only 0.2% of children had used of tobacco products in last six months and the remaining 99.8% of children had not used any kind of tobacco products in the last six months.

4.2.1.8.7. Baseline oral health related practice status

The oral health related practice status of the children was assessed using the oral health related practice (OHRP) score which was calculated based on how often the children cleaned their teeth, how they cleaned their teeth, how often they brushed their teeth, when they brushed their teeth in the morning, whether they brushed their teeth at night before going to bed, how they brushed their teeth, when they changed their tooth brush, whether the children cleaned their tongue, how they cleaned their tongue, whether they always washed their mouth after food, how frequently did they consume sweets, how frequently did they consume soft drinks, whether they had ever visited a dentist and whether they had used any tobacco products in last six months. The maximum score possible was 14 and the minimum score possible was zero. The baseline oral health related practice (OHRP) score of the children ranged from 3 to 11.6. The mean OHRP score of children was 8.169±1.4882.

4.2.1.9. Absenteeism from school due to oral health problems

About 13.3% of students had taken leave in the past three months due to oral health problems. Among those children who took leave from school due to oral health problems in the past three months, 67.7% of them took one day leave, 21% of them took two days leave and the rest 11.3% took more than two days of leave.

4.2.1.10. Main findings of baseline data analysis

- The base line survey and clinical oral examination were conducted among 465 children.
- The mean age of the children was 10.43±.92 years.

- About 58.7% of the children were boys and rest of them were girls.
- About 60.2 % of them belonged to low socio-economic status, rest of them belonged to medium (16.3%) and high socio-economic status (23.4%)
- The mean decayed extracted filled (def) teeth index score of children was 1.24±1.658
- The mean decayed missing filled teeth (DMFT) index score of children was 0.74±1.201
- The prevalence of dental caries among the children was 67.1% (62.73 - 71.26%). The prevalence of dental caries in deciduous dentition of the children was 52.25% (47.71-56.78%) and the prevalence of dental caries in permanent dentition of the children was 37.2% (32.90 – 41.67%). About 22.4% of children had dental caries in both deciduous and permanent dentition.
- The mean gingival index (GI) score of children was 0.778±0.452.
- The prevalence of mild gingivitis was 73.11% (69.09 – 77.15%) and that of moderate gingivitis was 24.9% (21.17 – 29.03%). Severe gingivitis was prevalent in 0.86% (0.23 – 2.18%) of children.
- The mean oral hygiene index – simplified (OHI-S0 score of children was 2.009±0.8758.
- Only 20% of children had good oral hygiene status. About 70.8% of children had fair oral hygiene status and about 9.2% of the children had poor oral hygiene status.
- The most common source of information of oral health related information for children were their parents
- Only 70 % of the children had the knowledge regarding the symptoms of dental caries.
- About 56.6% of children had no idea regarding the symptoms of gum diseases and about 57% of children had no idea how to prevent gum diseases.
- Only 39.8% of children knew that oral health and general health are related.

- The mean oral health related knowledge (OHRK) score of children was 4.39±1.35
- Only 56% of the children felt the need for regular dental checkup.
- Only 57.4 % of children responded positively to the option of visiting a dentist if they experienced tooth ache. Some children even opted for options like taking medication without seeing dentist and placing eucalyptus oil on tooth if they experienced tooth pain.
- Only 32 % of children responded positively to the option of visiting a dentist if they experienced bleeding from gums. About 23.4% of children had no idea what to do if they experienced bleeding from their gums.
- The mean oral health related attitude (OHRA) score of children was 2.452±1.012.
- Almost all the children cleaned their teeth daily. About 97.8 % of children cleaned their teeth by themselves.
- The most common materials used by the children to clean their teeth was tooth brush and tooth paste (62.6%). About 15% of children used charcoal either regularly or occasionally to clean their teeth. Some children used materials like tooth power, salt and mango leaf to clean their teeth.
- All the children brushed their teeth at least once daily. Only 55% of the children brushed their teeth at least two times daily that was done at morning and at night before going to bed. Majority of children did their morning brushing before the breakfast.
- Among those children who brushed their teeth only once daily, 66% of them failed to brush their teeth twice daily because of forgetfulness and 19% of them failed to do so because of laziness.
- About 86 % of children were not following the correct brushing technique.
- About 50 % of the children did not change their tooth brush in three months.

- About 90% of the children cleaned their tongue; among those children 78.8% used tongue cleaners and 17.5% used midrib of coconut leaf to clean their tongue.
- About 99.6 % of children reported that they always washed their mouth after taking food About 48.2 % children reported that they ate sweets once in a week while 15.3% of them reported that they daily had sweets.
- About 47.5% of children reported that they never drank any soft drinks while 38.7% of them reported that they had soft drinks once in a week.
- About 44.3% of children had never visited a dentist.
- Among those children who had visited dentist only 22% of them had visited dentist in last six months and only 1.5% of them had their last dental visit for regular dental checkup.
- About 0.2% of children had used tobacco products in last six months
- The mean oral health related practice (OHRP) score of children was 8.169±1.4882
- The absenteeism from school in the last three months due to oral health problems was about 13.3%.

4.2.1.11. The epidemiological assessment

The epidemiological assessment is a part of the phase 2 of the PRECEDE–PROCEED model where we try to find out the health issues which need to be focused during the intervention program. The analysis of the data from the baseline clinical oral examination helped to achieve the epidemiological assessment.

The oral hygiene status, the gingival health status and the dental caries status of the children were assessed in the baseline clinical oral examination and the results (Table 30) indicated that oral hygiene status, gingivitis and dental caries were the health issues that needed attention while planning the intervention program (Table 31).

Table 30: Findings from baseline data analysis that helped to achieve the epidemiological assessment

Findings from baseline data analysis that helped to achieve the epidemiological assessment	
Finding	Indication
• Only 20% of children had good oral hygiene status. About 70.8% of children had fair oral hygiene status and about 9.2% of the children had poor oral hygiene status. • The mean OHI-S score of children was 2.009±0.8758	Oral hygiene status of the children needed attention
• About 73.11% of children had mild gingivitis, 24.9% of the children had moderate gingivitis and 0.86% of the children had sever gingivitis. • The mean gingival index (GI) score of children was 0.778±0.452	Gingival health status of the children needed attention
• About 67.1% of children had dental caries, 52.25% of children had their deciduous dentition affected with dental caries while 37.2% of children had their permanent dentition affected by dental caries. About 22.4% of children had dental caries in both deciduous and permanent dentition. • The mean decayed extracted filed (def) teeth index score of children was 1.24±1.658 • The mean decayed missing filled teeth (DMFT) index score of children was 0.74±1.201	Dental caries status of the children needed attention

Table 31: The epidemiological assessment

The epidemiological assessment (The health issues the intervention program would focus)
The oral hygiene status Gingivitis Dental caries

4.2.1.12. The predisposing, reinforcing, and enabling factors

The analysis of the baseline survey data helped us to achieve the educational and ecological assessment part of the phase 3 of the PRECEDE–PROCEED model by helping us to understand the predisposing, reinforcing, and enabling factors. The findings regrinding the existing knowledge, attitude and skills of the children helped us to understand the predisposing factors (Figure 9). Along with those findings, the findings regarding existing practices of the children gave us the indication regarding the areas which needed attention in the form of reminders, motivation, awareness and training (Table 32). The areas which needed reminders and motivation were the reinforcing factors and those areas which needed awareness and training were the enabling factors (Table 33).

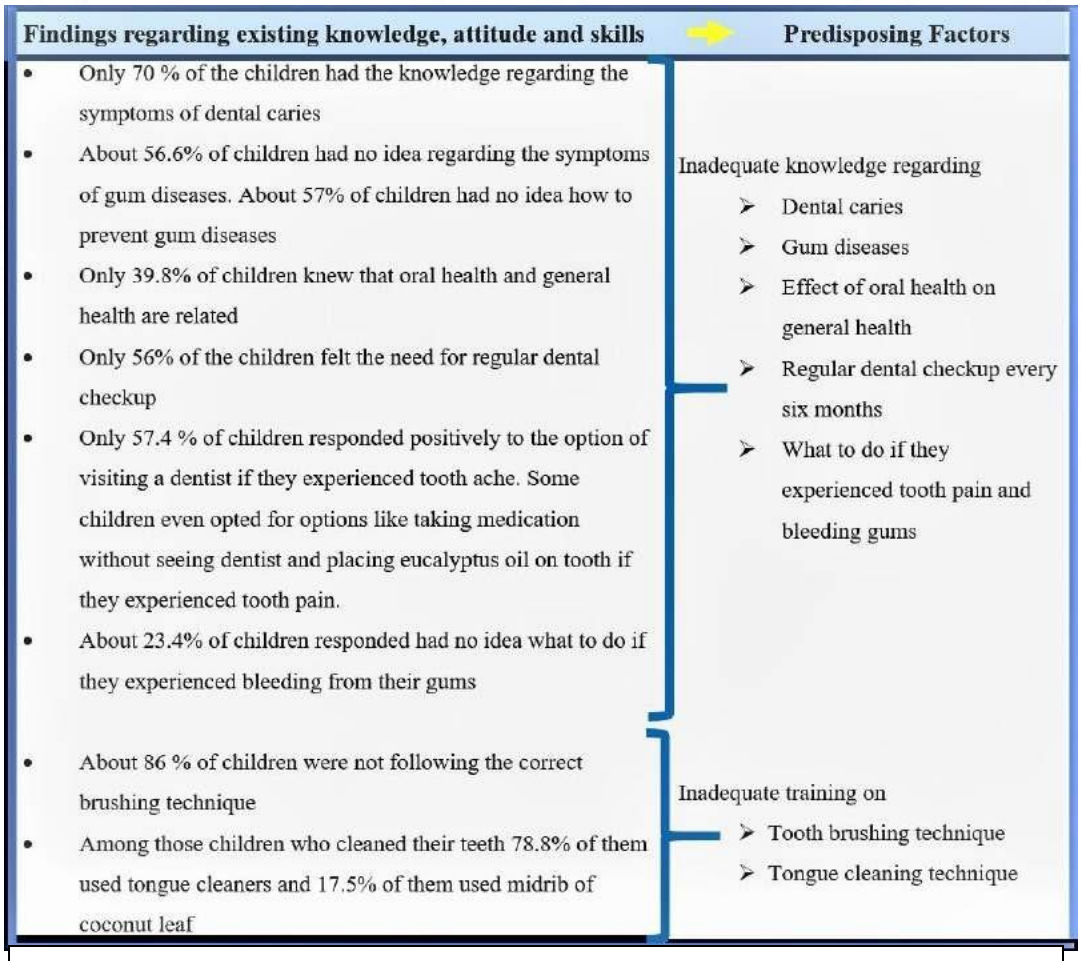


Figure 9: The predisposing factors

Table 32: Findings from baseline data analysis regarding existing knowledge, attitude, skills and practices of the children and their indication for the intervention

Findings from baseline data analysis regarding existing knowledge, attitude, skills and practices of the children and their indications for the intervention	
Finding	Indication for the intervention
Only 70 % of the children had the knowledge regarding the symptoms of dental caries	Awareness regarding dental caries
About 56.6% of children had no idea regarding the symptoms of gum diseases	Awareness regarding gum diseases
About 57% of children had no idea how to prevent gum diseases	
Only 39.8% of children knew that oral health and general health are related	Awareness regarding the effect of oral health on general health
Only 56% of the children felt the need for regular dental checkup	Awareness regarding the importance of regular dental checkup every six months
About 44.3% of children had never visited a dentist	
Only 57.4 % of children responded positively to the option of visiting a dentist if they experienced tooth ache. Some children even opted for options like taking medication without seeing dentist and placing eucalyptus oil on tooth if they experienced tooth pain.	Awareness regarding what to do if they experienced tooth pain
About 23.4% of children responded had no idea what to do if they experienced bleeding from their gums	Awareness regarding what to do if they experienced bleeding from gums
About 15% of children used charcoal either regularly or occasionally to clean their teeth. Some children used materials like tooth power, salt and mango leaf to clean their teeth.	Awareness regarding the detrimental effects of charcoal, tooth powder, salt, mango leaf

Only 55% of the children brushed their teeth at least two times daily and majority of children brushed their teeth before breakfast in the morning	Awareness regarding the importance of twice daily tooth brushing and morning tooth brushing after breakfast
Among those children who brushed their teeth only once daily, 66% of them failed to brush their teeth twice daily because of forgetfulness and 19% of them failed to do so because of laziness	Reminders and motivation for encouraging the children to brush their teeth twice daily
About 86 % of children were not following the correct brushing technique	Training on correct brushing technique
About 50 % of the children did not change their tooth brush in three months	Awareness regarding when to change the tooth brush
Among those children who cleaned their teeth 78.8% of them used tongue cleaners and 17.5% of them used midrib of coconut leaf	Training on how to clean the tongue
About 15.3% of the children daily had sweets and 38.7% of them had soft drinks once in a week	Awareness regarding dietary habits good for oral health
About 0.2% of children had reported the use of tobacco products in last six months	Awareness regarding the detrimental effects of tobacco products

Table 33: The Reinforcing and Enabling factors

Reinforcing factors	Enabling factors
Reminders and motivation for twice daily tooth brushing	Awareness regarding • Dental caries • Gum diseases • Effect of oral health on general health • Regular dental checkup every six months • What to do if they experienced tooth pain and bleeding gums

	• Twice daily tooth brushing and morning tooth brushing after breakfast • When to change the tooth brush • Dietary habits good for oral health • Detrimental effects of charcoal, tooth powder, salt, mango leaf, tobacco products Training on • Tooth brushing technique • Tongue cleaning technique

4.2.2. Baseline comparison of intervention group and the control group

The baseline survey and clinical oral examination were conducted among 465 children, of which 453 children consented to be the part of the intervention phase. The control group had 228 children and the intervention group had 225 children. The baseline comparison of the intervention group and the control group were done to find out whether the groups were similar to each with respect to the outcomes we studied and with respect to the factors that could have an effect on those outcomes we studied.

4.2.2.1. Baseline comparison of the factors that could have an effect on the outcomes

4.2.2.1.1. Type of school

Since all the children studied in government schools, the intervention group and the control group were similar in terms on the type of school in which the children studied.

4.2.2.1.2. The medium of education of the children

In the intervention group about 48.9% of the children studied in English medium schools and the rest (51.1%) in Malayalam medium schools. In the control group about 51.3% of the children studied in English medium schools and the rest (48.7%) in Malayalam medium schools. There was only a slight difference between the two groups in terms of the proportion of students studying in English and Malayalam medium schools and the Pearson Chi square test indicated that the difference was not significant ($p > 0.05$) (Table 34). So at the baseline the intervention group and the control group were similar in terms of the proportion of the children studying in different mediums of education.

Table 34: Baseline comparison of intervention and control group according to the medium of education of the children

Baseline comparison of intervention and control group according to the medium of education of the children				
Medium of education	Control N (%)	Intervention N (%)	Pearson Chi square	p value
English	117 (51.3%)	110 (48.9%)	0.267	0.605
Malayalam	111 (48.7%)	115 (51.1%)		
Total	228 (100%)	225 (100%)		

4.2.2.1.3. The location of the school of the children

In the intervention group 49.8% of children were from the urban schools and the rest (50.2%) were from rural schools. In the control group 35.5% of children were from the urban schools and the rest (64.5%) were from rural schools. There was difference between the two groups in terms of the proportion of students studying in schools located in urban and rural areas and the Pearson Chi square test indicated that the difference was significant ($p < 0.05$) (Table 35). So at the baseline

the intervention group and the control group were different from each other in terms of the proportion of the children studying in schools located in urban and rural areas.

Table 35: Baseline comparison of intervention and control group according to the location of the school of the children

Baseline comparison of intervention and control group according to the location of the school of the children				
Location of the school	Control N (%)	Intervention N (%)	Pearson Chi square	p value
Urban	81 (35. 5%)	112 (49.8%)	9.406	0.002
Rural	147 (64.5%)	113 (50.2%)		
Total	228 (100%)	225 (100%)		

4.2.2.1.4. The age of the children

The mean age of children in control and intervention group were 10.65 ±1 and 10.19±.79 respectively. Even though it appeared that there was not much difference in the mean age of the children in the two groups, the Independent sample T test showed that the difference was significant ($p < 0.05$) (Table 36). So, at the baseline the intervention group and the control group were different from each other in terms of the age of the children.

Table 36: Baseline comparison of intervention and control group according to the age of the children

Baseline comparison of intervention and control group according to the age of the children							
		N	Mean	Std deviation	Mean difference	t	p
Age	Control	228	10.65	1.001	0.467	5.501	0.001
	Intervention	225	10.19	0.791			

4.2.2.1.5. The sex of the children

In the intervention group 60% of children were males and the rest (40%) were females. In the control group 58.8% of children were males and the rest (41.2%) were females. There was only a small difference between the two groups in terms of the proportion of the male and female children and the Pearson Chi square test indicated that the difference was not significant ($p > 0.05$) (Table 37). So at the baseline the intervention group and the control group were similar in terms of the proportion of the male and female children.

Table 37: Baseline comparison of intervention and control group according to the sex of the children

Baseline comparison of intervention and control group according to the sex of the of the children				
Sex of the children	Control N (%)	Intervention N (%)	Pearson Chi square	p value
Male	134 (58.8%)	135 (60.0%)	0.071	0.790
Female	94 (41.2%)	90 (40.0%)		
Total	228 (100%)	225 (100%)		

4.2.2.1.6. The socio economic status (SES) of the children

In the intervention group 61.8% of children belonged to the low SES, 16.06% of the children belonged to medium SES and rest 22.2% of the children belonged to high SES. In the control group 57.9% of children belonged to low SES, 17.1% of the children belonged to medium SES and rest 25% of the children belonged to high SES. There was only a small difference between the two groups in terms of the SES of the children and the Pearson Chi square test indicated that the difference was not significant ($p > 0.05$) (Table 38). So, at the baseline the intervention group and the control group were similar in terms of the SES of the children.

Table 38: Baseline comparison of intervention and control group according to the socio-economic status (SES) of the children

Baseline comparison of intervention and control group according to the socio-economic status (SES) of the of the children				
SES of the children	Control N (%)	Intervention N (%)	Pearson Chi square	p value
Low	132 (57.9%)	139 (61.8%)	0.739	0.691
Middle	39 (17.1%)	36 (16.0%)		
High	57 (25.0%)	50 (22.2%)		
Total	228 (100%)	225 (100%)		

4.2.2.2. Baseline comparison of the outcomes of the study

4.2.2.2.1. Baseline comparison of intervention and control group according to the oral hygiene status of the children

The mean OHI-S score of children in control and intervention group were 2.02 ±0.87 and 2.02±0.87 respectively. There was only a very small difference in the mean OHI-S score of the children in the two groups and the Independent sample T test showed that the difference was not significant ($p > 0.05$) (Table 39). So, at the baseline the intervention group and the control group were similar in terms of the oral hygiene status of the children.

Table 39: Baseline comparison of intervention and control group according to the oral hygiene status of the children

Baseline comparison of intervention and control group according to the oral hygiene status of the children							
		N	Mean OHI-S score	Std deviation	Mean difference	t	p
OHI-S score	Control	228	2.0200	0.87286	-0.0089	-0.108	0.914
	Intervention	225	2.0289	0.87473			

4.2.2.2.2. Baseline comparison of intervention and control group according to the gingival health status of the children

The mean GI score of children in control and intervention group were 0.81±0.41 and 0.75±0.48 respectively. There was only a very small difference in the mean GI score of the children in the two groups and the Independent sample T test showed that the difference was not significant ($p > 0.05$) (Table 40). So at the baseline the intervention group and the control group were similar in terms of the gingival health status of the children.

Table 40: Baseline comparison of intervention and control group according to the gingival health status of the children

Baseline comparison of intervention and control group according to the gingival health status of the children							
		N	Mean GI score	Std deviation	Mean difference	t	p
GI score	Control	228	0.81	0.418	0.06	1.458	0.146
	Intervention	225	0.75	0.484			

4.2.2.2.3. Baseline comparison of intervention and control group according to the dental caries status of the children

4.2.2.2.3.1. Baseline comparison of intervention and control group according to the dental caries status of deciduous teeth of the children

The mean def score of children in control and intervention group were 1.17±1.67 and 1.28±1.63 respectively. There was only a very small difference in the mean def score of the children in the two groups and the Independent sample T test showed that the difference was not significant (p >0.05) (Table 41). So, at the baseline the intervention group and the control group were similar in terms of the dental caries status of deciduous teeth of the children.

Table 41: Baseline comparison of intervention and control group according to the dental caries status of deciduous teeth of the children

Baseline comparison of intervention and control group according to the dental caries status of deciduous teeth of the children							
		N	Mean def score	Std deviation	Mean difference	t	p
def score	Control	228	1.17	1.67	-0.11	-0.67	0.502
	Intervention	225	1.28	1.28			

4.2.2.2.3.2. Baseline comparison of intervention and control group according to the dental caries status of permanent teeth of the children

The mean DMFT score of children in control and intervention group were 0.70±1.105 and 0.79±1.310 respectively. There was only a very small difference in the mean DMFT score of the children in the two groups and the showed that the difference was not significant (p >0.05) (Table

42). So, at the baseline the intervention group and the control group were similar in terms of the dental caries status of permanent teeth of the children.

Table 42: Baseline comparison of intervention and control group according to the dental caries status of permanent teeth of the children

Baseline comparison of intervention and control group according to the dental caries status of permanent teeth of the children							
		N	Mean DMFT score	Std deviation	Mean difference	t	p
DMFT score	Control	228	0.70	1.105	-0.09	-0.785	-0.433
	Intervention	225	0.79	1.310			

4.2.2.2.4. Baseline comparison of intervention and control group according to the oral health related knowledge status of the children

The mean OHRK score of children in control and intervention group were 4.36±1.412 and 4.44±1.295 respectively. There was only a very small difference in the mean OHRK score of the children in the two groups and the Independent sample T test showed that the difference was not significant ($p > 0.05$) (Table 43). So, at the baseline the intervention group and the control group were similar in terms of the oral health related knowledge status of the children.

Table 43: Baseline comparison of intervention and control group according to the oral health related knowledge status of the children

Baseline comparison of intervention and control group according to the oral health related knowledge status of the children							
		N	Mean OHRK score	Std deviation	Mean difference	t	p
OHRK score	Control	228	4.36	1.412	-0.08	-0.666	0.506
	Intervention	225	4.44	1.295			

4.2.2.2.5. Baseline comparison of intervention and control group according to the oral health related attitude status of the children

The mean OHRA score of children in control and intervention group were 2.41±1.018 and 2.51±1.018 respectively. There was only a very small difference in the mean OHRA score of the children in the two groups and the Independent sample T test showed that the difference was not significant ($p > 0.05$) (Table 44). So at the baseline the intervention group and the control group were similar in terms of the oral health related attitude status of the children.

Table 44: Baseline comparison of intervention and control group according to the oral health related attitude status of the children

Baseline comparison of intervention and control group according to the oral health related attitude status of the children							
		N	Mean OHRA score	Std deviation	Mean difference	t	p
OHRA score	Control	228	2.41	1.018	-0.10	-0.987	0.324
	Intervention	225	2.51	1.018			

4.2.2.2.6. Baseline comparison of intervention and control group according to the oral health related practice status of the children

The mean OHRP score of children in control and intervention group were 8.09±1.535 and 8.24±1.448 respectively. There was only a very small difference in the mean OHRP score of the children in the two groups and the Independent sample T test showed that the difference was not significant ($p > 0.05$) (Table 45). So at the baseline the intervention group and the control group were similar in terms of the oral health related practice status of the children.

Table 45: Baseline comparison of intervention and control group according to the oral health related practice status of the children

Baseline comparison of intervention and control group according to the oral health related practice status of the children							
		N	Mean OHRP score	Std deviation	Mean difference	t	p
OHRP score	Control	228	8.09	1.535	-0.15	-1.055	0.526
	Intervention	225	8.24	1.448			

4.2.2.3. Main findings of the baseline comparison of intervention group and the control group

- The control group had 228 children and the intervention group had 225 children.
- At the baseline, the intervention group and the control group were similar to each other with respect to all the outcomes we studied which were the oral hygiene status of the children, the gingival health status of the children, the dental caries status of the children, the oral health related knowledge status of the children, the oral health related attitude status of the children and the oral health related practice status of the children.
- With respect to the factors that could have an effect on the outcomes we studied,
  - at the baseline, the intervention group and the control group were similar to each in terms of the type of the school the children studied, the medium of education of the children, the sex of the children and the socio-economic status of the children.
  - at the baseline, the intervention group and the control group had differences in terms of the location of the school the children and the age of the children.

4.2.3. Post intervention comparison of the intervention group and the control group

The post intervention survey and clinical oral examination were conducted among all the 453 children. There was no loss to follow up. The control group had 228 children and the intervention group had 225 children.

- The results at this stage showed the effect of the OHE intervention
    - on the oral hygiene status of 6-12 year old children (major objective)
    - on the gingival health status of 6-12 year old children
    - on the prevalence of gingivitis of 6-12 year old children (minor objective 3)
    - on the oral health related knowledge, attitude and practices of 6-12 year old children (minor objective 4).
    - on the dental caries status of 6-12 year old children
- The results from this stage helped to find out the impact evaluation and outcome evaluation of the OHE intervention program.

4.2.3.1. Post intervention comparison of intervention and control group according to the oral hygiene status of the children

In the intervention group the mean OHI-S score decreased from 2.02 ±0.87 at the baseline to 1.65±0.80, post intervention. In the control group the mean OHI-S score slightly increased from 2.02 ±0.87 at the baseline to 2.18±0.86, post intervention. A decreased OHI-S indicated an improved oral hygiene status. So post intervention, in the intervention group the oral hygiene status of the children had improved; while in the control group the oral hygiene status of the children

slightly worsened. The Independent sample T test showed that there was significant dissimilarity in the differences of OHI-S score between the two groups ($p < 0.05$) (Table 46). Age and location of the school were the factors which could have an effect on the outcome of the study. The linear regression model showed that the difference in OHI-S score was not significantly dependent on age of the children or location of their school ($p > 0.05$) (Table 47).So the OHE intervention program was effective in improving the oral hygiene status of 6-12 year old children.

Table 46: Post intervention comparison of intervention and control group according to the oral hygiene status of the children

Post intervention comparison of intervention and control group according to the oral hygiene status of the children									
	N	Mean	Std deviation	Mean	Std deviation	Mean	Std deviation	t	p value
		*BL OHI-S score		**PI OHI-S score		(PI OHI-S score)-(BL OHI-S score)			
Control	228	2.020	0.872	2.18	0.867	0.164	0.213	17.08	0.001
Intervention	225	2.028	0.874	1.65	0.807	-0.378	0.429		
*BL –Baseline, **PI – Post Intervention									

Table 47: Model illustrating how difference in OHI-S score was related to age and location of the school

Model illustrating how difference in OHI-S score was related to age and location of the school				
Model	Regression coefficient	Std error	t	P value
Constant	-0.526	0.241	-2.182	0.03
Age	0.031	0.022	1.428	0.15
Location of school	0.060	0.041	1.466	0.14
Dependent variable: Difference in OHI-S score Independent variable: Age, Location of the school				

4.2.3.2. Post intervention comparison of intervention and control group according to the gingival health status of the children

In the intervention group the mean GI score decreased from 0.75 ±0.484 at the baseline to 0.60±0.439 post intervention. In the control group the mean GI score slightly increased from 0.81 ±0.418 at the baseline to 0.97±0.439 post intervention. A decreased GI indicated an improved gingival health status. So post intervention, in the intervention group the gingival health status of the children had improved; while in the control group the gingival health status of the children slightly worsened. The Independent sample T test showed that there was significant dissimilarity in the differences of GI score between the two groups ($p < 0.05$) (Table 48). So the OHE intervention program was effective in improving the gingival health status of the 6-12 year old children.

Table 48: Post intervention comparison of intervention and control group according to the gingival health status of the children

Post intervention comparison of intervention and control group according to the gingival health status of the children									
	N	Mean	Std deviation	Mean	Std deviation	Mean	Std deviation	t	p value
		*BL GI score		**PI GI score		(PI GI score)-(BL GI score)			
Control	228	0.81	0.418	0.97	0.439	0.16	0.18	20.7	0.001
Intervention	225	0.75	0.484	0.60	0.439	-0.15	0.13		
*BL –Baseline, **PI – Post Intervention									

4.2.3.3. Effect of OHE on the prevalence of gingivitis among 6-12 year old children

Since only the children in the intervention group received the OHE intervention, to find out the effect of OHE on the prevalence of gingivitis we needed to find whether there was significant change in the proportion of children with various severity of gingivitis in the intervention group after the intervention.

The proportion of children with various severity of gingivitis was calculated depending on the grading of their gingival index score as given in table 7. Since there were only a very few children with normal gingival health status and severe gingivitis in the intervention and group, for sake easy comparison normal gingival health status and mild gingivitis were considered as onecategory; similarly moderate and severe gingivitis were considered as one category.

A decrease in the severity in the form of gingivitis is an indication of improvement of gingival health. In the intervention group the proportion of children in the moderate and severe gingivitis category decreased from 20.95% at the baseline to 15.6% post intervention. The proportion of children in the normal and mild gingivitis category increased from 79.1% at the baseline to 84.4% post intervention. The MacNemar test showed that there was significant difference between the proportion of children in the two categories of gingivitis at baseline and post intervention ($p < 0.05$) (Table 49). So the OHE intervention had resulted an increase in the prevalence of normal and mild gingivitis and a decrease in the prevalence of moderate and severe gingivitis leading to an improvement in the gingival health status of the children in the intervention group.

Table 49: Comparison of proportion of various forms of gingivitis at baseline and post intervention in the intervention group

Comparison of proportion of various forms of gingivitis at baseline and post intervention in the intervention group						
		Baseline		Post intervention		p value
		Frequency (N)	Percent (%)	Frequency (N)	Percent (%)	
Gingivitis	Normal and mild gingivitis	178	79.1%	190	84.4%	0.002
	Moderate and Severe gingivitis	47	20.9%	35	15.6%	
Total		225	100%	225	100%	

4.2.3.4. Post intervention comparison of intervention and control group according to the oral health related knowledge of the children

An increased OHRK score indicated an improved oral health related knowledge of the children. In the intervention group the mean OHRK score increased from 4.44±1.295 at the baseline to 6.77±0.534 post intervention. In the control group also the mean OHRK score slightly increased from 4.36±1.412 at the baseline to 5.06±1.388 post intervention. So post intervention there was improvement in the oral health related knowledge of the children in both the groups, but the children in the intervention showed more improvement than the children in the control group. The

Independent sample T test showed that there was significant dissimilarity in the differences of OHRK score between the two groups ($p < 0.05$) (Table 50). So the OHE intervention program was effective in improving the oral health related knowledge of the 6-12 year old children.

Table 50: Post intervention comparison of intervention and control group according to the oral health related knowledge of the children

Post intervention comparison of intervention and control group according to the oral health related knowledge of the children									
	N	Mean	Std deviation	Mean	Std deviation	Mean	Std deviation	t	p value
		*BL OHRK score		**PI OHRK score		(PI OHRK score)-(BL OHRK score)			
Control	228	4.36	1.412	5.06	1.388	0.70	1.061	-14.64	0.002
Intervention	225	4.44	1.295	6.77	0.534	2.32	1.288		
*BL –Baseline, **PI – Post Intervention									

4.2.3.5. Post intervention comparison of intervention and control group according to the oral health related attitude of the children

An increased OHRA score indicated an improved oral health related attitude of the children. In the intervention group the mean OHRA score increased from 2.51±1.018 at the baseline to 3.88±0.377 post intervention. In the control group also the mean OHRA score slightly increased from 2.41±1.018 at the baseline to 3.01±0.991 post intervention. So post intervention, there was improvement in the oral health related attitude of the children in both the groups, but the children in the intervention showed more improvement than the children in the control group. The Independent sample T test showed that there was significant dissimilarity in the differences of

OHRA score between the two groups ($p < 0.05$) (Table 51). So the OHE intervention program was effective in improving the oral health related attitude of the 6-12 year old children.

Table 51: Post intervention comparison of intervention and control group according to the oral health related attitude of the children

Post intervention comparison of intervention and control group according to the oral health related attitude of the children									
	N	Mean	Std deviation	Mean	Std deviation	Mean	Std deviation	t	p value
		*BL OHRA score		**PI OHRA score		(PI OHRA score)-(BL OHRA score)			
Control	228	2.41	1.018	3.01	0.991	0.60	0.926	-8.465	0.001
Intervention	225	2.51	1.018	3.88	0.377	1.37	1.014		
*BL –Baseline, **PI – Post Intervention									

4.2.3.6. Post intervention comparison of intervention and control group according to the oral health related practices of the children

An increased OHRP score indicated an improved oral health related practices of the children. In the intervention group the mean OHRP score increased from 8.24±1.448 at the baseline to 11.45±1.43 post intervention. In the control group also the mean OHRP score slightly decreased from 8.09±1.535 at the baseline to 7.79±1.70 post intervention. So post intervention, in the intervention group the oral health related practices of the children had improved. In the control group the oral health practices of the children slightly worsened. The Independent sample T test showed that there was significant dissimilarity in the differences of OHRP score between the two groups ($p < 0.05$) (Table 52). So the OHE intervention program was effective in improving the oral health related practices of the 6-12 year old children.

Table 52: Post intervention comparison of intervention and control group according to the oral health related practices of the children

Post intervention comparison of intervention and control group according to the oral health related practices of the children									
	N	Mean	Std deviation	Mean	Std deviation	Mean	Std deviaton	t	p value
		*BL OHRP score		**PI OHRP score		(PI OHRP score)-(BL OHRP score)			
Control	228	8.09	1.535	7.79	1.70	-0.31	1.38	-23.114	0.001
Intervention	225	8.24	1.448	11.45	1.43	3.21	1.83		
*BL –Baseline, **PI – Post Intervention									

4.2.3.7. Post intervention comparison of intervention and control group according to the dental caries status of the children

4.2.3.7.1. Post intervention comparison of intervention and control group according to the dental caries status deciduous teeth of the children

The def is an irreversible index; the def score once attained cannot be reversed. In the intervention group the mean def score slightly increased from 1.28±1.63 at the baseline to 1.29±1.63 post intervention. In the control group the mean OHRP score increased from 1.17±1.67 at the baseline to 1.27±1.74 post intervention. So post intervention, there was increase in the def score of the children in both the groups. The magnitude of increase was less in the intervention group. The Independent sample T test showed that there was significant dissimilarity in the differences of def score between the two groups ($p < 0.05$) (Table 53). This meant that even though dental caries

status of the deciduous teeth of children in both the groups increased in the post intervention period it was significantly less in the intervention group. So the OHE intervention was effective in proving a better dental health status of the deciduous teeth to children in the intervention group compared to the children in the control group.

Table 53: Post intervention comparison of intervention and control group according to the dental caries status deciduous teeth of the children

Post intervention comparison of intervention and control group according to the dental caries status deciduous teeth of the children									
	N	Mean	Std deviation	Mean	Std deviation	Mean	Std deviaton	t	p value
		*BL def score		**PI def score		(PI def score)-(BL def score)			
Control	228	1.17	1.67	1.27	1.74	0.10	0.34	3.28	0.001
Intervention	225	1.28	1.67	1.29	1.63	0.01	0.16		
*BL –Baseline, **PI – Post Intervention									

4.2.3.7.2. Post intervention comparison of intervention and control group according to the dental caries status permanent teeth of the children

The DMFT is an irreversible index; the DMFT score once attained cannot be reversed. In the intervention group the mean DMFT score slightly increased from 0.79±1.310 at the baseline to 0.84±1.33 post intervention. In the control group the mean DMFT score increased from 0.70±1.105 at the baseline to 0.98±1.33 post intervention. So post intervention, there was increase in the DMFT score of the children in both the groups. The magnitude of increase was less in the intervention group. The Independent sample T test which showed that there was significant dissimilarity in the differences of DMFT score between the two groups ($p < 0.05$) (Table 54). This

meant that even though dental caries status of the permanent teeth of children in both the groups increased in the post intervention period it was significantly less in the intervention group. So the OHE intervention was effective in proving a better dental health status of the permanent teeth to children in the intervention group compared to the children in the control group.

Table 54: Post intervention comparison of intervention and control group according to the dental caries status permanent teeth of the children

Post intervention comparison of intervention and control group according to the dental caries status permanent teeth of the children									
	N	Mean	Std deviation	Mean	Std deviation	Mean	Std deviaton	t	p value
		*BL DMFT score		**PI DMFT score		(PI DMFT score)-(BL DMFT score)			
Control	228	0.70	1.105	0.98	1.33	0.28	0.67	4.74	0.001
Intervention	225	0.79	1.310	0.84	1.33	0.05	0.24		
*BL –Baseline, **PI – Post Intervention									

4.2.3.8. Main findings of the post intervention comparison of intervention group and the control group

- The OHE intervention program
  - was effective in improving the oral hygiene status and gingival health status of the 6-12 year old children.
  - resulted an increase in the prevalence of normal and mild gingivitis and a decrease in the prevalence of moderate and severe gingivitis indicating an improvement in the gingival health status of the children in the intervention group.

- was effective in improving the oral health related knowledge, attitude and practices of the 6-12 year old children.
- was effective in proving a better dental health status of the deciduous and permanent teeth to children in the intervention group compared to the children in the control group.

4.2.3.9. Impact evaluation

Impact evaluation is the phase 7 of the PRECEDE–PROCEED model. Comparison of the data from post intervention survey between intervention and control group helped us to achieve the impact evaluation. Here we evaluated the effectiveness of the program with regards to the changes in existing knowledge, attitude, skills and behaviors of the participants. The findings from the post intervention comparison of the intervention and the control group showed that the OHE intervention was effective in improving the oral health related knowledge, attitude and practice of the 6-12 year old children.

4.2.3.10. Outcome evaluation

Outcome evaluation is the phase 8 of the PRECEDE–PROCEED model. Comparison of the data from post intervention clinical oral examination between intervention and control group helped us to achieve the outcome evaluation. Here we evaluated the effect the program had on the health issues of the participants. The health issues of the participants addressed by this program were the oral hygiene status of the children, the gingival health status of the children and the dental caries status of the children. The findings from the post intervention comparison of the intervention and the control group showed that the OHE intervention was effective in in improving the oral hygiene

status and gingival health status of the 6-12 year old children. The OHE intervention was also effective in proving a better dental health status of the deciduous and permanent teeth to children in the intervention group compared to the children in the control group.

4.3. Results of the qualitative data analysis

4.3.1. Results of the qualitative data analysis from phase 1

Qualitative data in phase 1 in this study came from the FGDs with parents and teachers and from the IDIs with the parents.

4.3.1.1. FGDs with parents and teachers of 6-12 year old children

FGDs were conducted based on the principles of participation and relevance. The FGDs helped us to understand the oral hygiene habits and related situations of 6-12 year old children by gathering information directly from their parents and teachers.

4.3.1.1.1. Focus group discussions (FGDs) with teachers of 6-12 year old children

A total of six FGDs were conducted with the teachers. FGDs were conducted to understand the oral hygiene habits of children, dietary habits of children, common dental problems seen in children, absenteeism of children from school due to oral health problems, nearby available dental care services, dental visits of children, tobacco use among children etc. We also tried to find out whether oral hygiene practices or oral health had been a part of school syllabus, the suitable time and methods to conduct classes, the available facilities in their schools like free periods, class

rooms, plug points etc. The teachers' expectations regarding OHE class for children, their willingness to be part of the program, and their opinion regarding the usefulness of brushing chart were also explored.

4.3.1.1.1.1. Oral hygiene habits of children

According to the teachers the most common materials used by the children to clean their teeth were tooth brush and tooth paste. Children also used charcoal either occasionally or regularly. Some teachers reported that they have advised children to use charcoal to get rid of the yellow stains on the teeth. The teachers reported that only some children brushed their teeth twice daily, while most of the children brushed only once daily. According to the teachers, children did not brush their teeth at night because of forgetfulness, laziness, lack of motivation from parents, and discouragement from family members. Children used tongue cleaners or midrib of coconut leaf to clean their tongue. Children always washed their mouth after main meals like breakfast and lunch, but after eating snacks they did not wash their mouth either because they did not consider it necessary or because they did not get time to do so. Teachers were not sure whether the children drank water after eating snacks.

" It is believed that if we clean teeth with charcoal applying pressure we can recline forwardly placed teeth….but we have also heard that if apply pressures and brush teeth can wear off ….now there are tooth paste containing charcoal…so we are confused….regarding brushing…sometimes they forget to brush at night….some are lazy….one of my student told me that his grandmother had told him that he should not brush at night because it is a sin….we tell them to clean their tongue …some of them do…most of them use tongue cleaners…some use midribs of coconut leaves….after eating snacks most of the time they don't wash their mouth….they don't have such

habit…most of them don't think that is needed…sometimes bell will ring and they will run back to class, so no time to wash… we don't know whether they drink water or not"

The findings regarding the oral hygiene habits of the children indicated that children needed reminders and motivation for twice daily tooth brushing, training regarding tongue cleaning technique and awareness regarding washing mouth always after food. Children and teachers needed awareness regarding the detrimental effects of charcoal.

4.3.1.1.1.2. Dietary habits of children

Teachers reported that most children ate the breakfast and lunch given to them from the school. Children liked sweets and bakery foods. Children in lower primary (LP) classes, children who went directly to tuition classes from the school, and children who went home in the second trip of the school bus brought snacks to the school; usually they brought bakery items as snacks. Children were also fond of packet food items like 'ok byriyani', kurkure, lays, pickle packets, packet juices like 'zíp up' and various types of sweets like 'sweete', 'pulimuttayi' and 'kattamuttayi'. Sometimes one food packet or even packet juice like 'zip up' were shared by many children. These food items were cheap and the children bought these items either with their pocket money or their parents bought it for them. In schools with scarcity of water, many children drank pipe water when their bottle water was over.

"young children especially LP school children bring snacks to school…they like bakery food…it is for parents also…now we have requested them (parents) to send home made food as snacks for the children….they like packet foods also….packet food like 'ok byriyani' cost only rupees 5…children buy it with their pocket money…sometimes many children share one packet …even they share and suck packet juice like 'zip up'…it costs only rupees one…so they buy…here we

have scarcity of water…so we have asked children to bring water from home…sometimes when the bottle water was over they (children) drank pipe water"

These finding regarding the dietary habits of the children indicated that children needed awareness regarding good dietary habits

4.3.1.1.1.3. Dental problems seen in children

Tooth decay, swelling in gums, retained milk teeth, irregularly placed teeth were the common dental problems in children.

"nowadays milk teeth have to be extracted…they don't shed in time…..new teeth come irregularly"

Thus the findings regarding the common dental problems indicated that children and parents needed awareness regarding dental caries, gum diseases and importance of deciduous teeth.

4.3.1.1.1.4. Absenteeism of children from school due to oral health problems

Teachers reported that some children had taken leave from school due to oral health problems. Most children had taken one to two days of leave. Some children had even taken up to five days of leave from school due to tooth pain.

"sometimes they take leave…usually one or two days…one of my student took five days leave ,,,he had tooth pain and swelling….and after tooth extraction …it took some time for the swelling to go ..so he missed the school"

The findings regarding the absenteeism of the children from the school due to oral health problem indicated the need for oral health education intervention program for the children.

4.3.1.1.1.5. Nearby available dental care services

According to the teachers most of the nearby clinics were private dental clinics, but there the treatments were costly. The available government facility was Government dental college, but there was delay in getting appointment from Government dental college. If the appointment was missed parents had to wait many days for the next appointment.

"in dental college it is very difficult to get the appointment…..first we have to register…then they will send us a letter with an appointment date….if the parents miss that date due to their work problems….they will have to wait for many days for next date"

The findings regarding nearby available dental care services indicated that lack of available and affordable nearby dental care services affected the oral health care of the children.

4.3.1.1.1.6. Dental visits of children

According to the teachers the parents did not took their children for regular dental checkups. But in case of emergencies like trauma and tooth loos, parents immediately took their children to the dentist. In case of tooth pain some parents first tried to manage the pain with salt water gargle when the pain becomes unbearable, they took their children to the dentist.

"we don't think they (parents) take the children for regular dental checkup"

The findings regarding the dental visits of the children indicated that parents and children needed awareness regarding the importance of regular dental checkup.

4.3.1.1.1.7. Tobacco use among children

Teachers reported that in upper primary (UP) schools they had not noticed any tobacco use among the children. In high schools (HS) and higher secondary schools (HSS) the UP-class children sometimes picked up and used the discarded cigarette pieces left by the elder children in the common toilet area. In some schools with higher classes school authorities had found cigarette pieces in the school premises and they had to call the Police and the Excise department who came and ceased tobacco products from the shops near the schools.

"in our school we have high school children also…. young children get influence by them…all of them share common toilet…sometimes young children pick up the cigarette pieces left there by elder students and try to use them"

These findings indicated that the children needed awareness regarding the detrimental effects of tobacco products.

4.3.1.1.1.8. Whether oral hygiene practices or oral health had been a part of school syllabus

Teachers reported that in Environmental studies (EVS) children had to learn about daily hygiene practices which included morning tooth brushing. In seventh standard Science children had to learn about different types of teeth. Teachers reported that during physical education classes of younger children they asked the children whether they had brushed their teeth and cut their nails. Teachers also reported that such physical education classes did not get the required importance in schools were physical education classes were taken by teachers dealing with other subjects due to unavailability of specific teachers to take the physical education classes.

"during physical education classes teachers usually asked children regarding tooth brushing and nail cutting…but now we don't have a specific teacher …other subject teachers take physical education so it does not get much importance"

Teachers reported that under the school health program of National health mission (NHM) a nurse used to visit the schools from the nearby primary health center (PHC) once in a month and do the health checkup of the children. The nurse checked the height and weight of the children, but did not do any oral heal health related checkup. Now in most of the schools the school health program was not functioning because of the non-availability of the nurses.

"Earlier a nurse used to come in the School health program…she came from the nearby PHC for health checkup of our children…she took their height and weight …but nothing related to oral health checkup"

The findings regarding whether oral hygiene practices or oral health had been a part of school syllabus indicated that oral heath did not get adequate importance in school syllabus and children needed oral health awareness.

4.3.1.1.1.9. Suitable time and methods to conduct classes

According to the teachers use of visual media like videos were the best way to convey information to children. Teachers reported that children were more attentive during the morning class hours especially during 10am to 11:30am and after that children became hungry and tend to lose attention; and during the afternoon class hours sometimes children were sleepy and less attentive. According to the teachers the children had an attention span of 20 to 30 minutes. Teachers also

reported that illustrating the main points in posters or charts and pasting them in the class rooms would help the children to remind the main points.

"children like to watch videos…best time to teach is morning 10 to 11:30…after that they start feeling hungry…after lunch some of them feel sleepy…attention span is about 20 to 30 minutes …some children have more attention span"

The finding regarding suitable time and methods to conduct classes indicated that in the OHE program the OHE classes should be conducted with help of 20 to 30-minute videos during the morning class hours and the main points of oral health information should be illustrated in charts and pasted in the classrooms as reminders for children.

4.3.1.1.1.10. Available facilities in the schools for conducting classes

Teachers reported that all schools had smart class rooms with laptops and projectors. Teachers had taken classes for children in the smart class room so the children were accustomed to such classes.

"all schools have smart class rooms…we have laptops and projectors…we take classes in the smart class room …. children are to these classes"

The findings regarding the available facilities in the schools indicated that OHE classes could be conducted in the smart class rooms using laptops and projectors

4.3.1.1.1.11. Expectations of the teachers regarding the OHE class

Teachers expected the OHE classes to cover topics like tooth brushing technique, how much tooth paste must be taken, importance of twice daily brushing, whether use of charcoal to clean teeth could cause any harmful effect on teeth etc.

"children don't know the correct method of brushing…. how much paste to take….even we are confused whether charcoal is good for teeth or not"

The expectations of the teachers regarding the OHE class indicated that the OHE classes should cover topics like tooth brushing technique, importance of twice daily tooth rushing, how much tooth paste to be taken and detrimental effects of charcoal.

4.3.1.1.1.12. Willingness of teachers to be part of the program

Teachers reported that they were willing to be part of the OHE program and remind the children regarding twice daily brushing. They were also ready for checking the brushing chart monthly. But teachers also reported that due to their busy work schedule they could not attend the OHE classes.

"we will do the checking of the brushing chart…that won't be a problem …and we will remind them regarding brushing two times…our work schedule is very tight….we won't get time to attend OHE classes …it would be helpful if you could give us some notice or leaflets containing the main points (of oral health information)"

The findings regarding the willingness of the teachers to be part of the OHE program indicated that in OHE program we could make use of the teachers help, especially the class teachers help for checking the brushing chart monthly, reminding and motivating children regarding twice daily brushing. The findings also indicated that conducting separate OHE classes for teachers was not feasible due to the busy work schedule of the teachers. So, it was decided to distribute pamphlets with oral health information among the teachers.

4.3.1.1.1.13. Teachers' opinion regarding the usefulness of brushing chart

Teachers reported that children would be interested in using brushing chart. Teachers felt that brushing chart would be useful in reminding children regarding twice daily tooth brushing.

"earlier children had made use of hygiene check list and improved their hygiene habits so would be interested in using brushing charts…they (brushing charts) could be a good method to remind children regarding night brushing"

The teachers' opinion regarding the usefulness of the brushing chart indicated that brushing chart would be useful in reminding children regarding twice daily tooth brushing.

4.3.1.1.2. Focus group discussions (FGDs) with parents of 6-12 year old children

A total of eight FGDs were conducted with the parents. FGDs were conducted to understand the oral hygiene habits of children, dietary habits of children, common dental problems seen in children, absenteeism of children from school due to oral health problems, nearby available dental care services, dental visits of children, tobacco use of children etc. The parents' expectations regarding OHE class for children, their willingness to be part of the program, and their opinion regarding the usefulness of brushing chart, and the use of mobile phones to reach out to them were also explored.

4.3.1.1.2.1. Oral hygiene habits of children

According to parents the most common materials used by children to clean their teeth were tooth brush and tooth paste. Children also used a variety of other materials like charcoal, mixture of salt,

pepper and charcoal, and Ayurvedic tooth powder. When children were very young some parents used sugar to clean children's teeth so that they would not cry. Charcoal was used either occasionally or regularly by many children. Some parents reported that they wanted their children to use charcoal, because they believed that cleaning teeth with finger using charcoal, by applying pressure they could recline forwardly placed teeth to some extent. They also thought that charcoal could whiten the yellow colored teeth. Children brushed their teeth only once daily that was in the morning before the breakfast. Children did not brush their teeth at night because of laziness, sleep or forgetfulness. Children cleaned their tongue using tongue cleaners or mid rib of coconut leaves. Some children did not clean their tongue as they were reluctant to use tongue cleaners. After main meals like breakfast, lunch and dinner children washed their mouth, but after eating snacks most of the time children did not wash their mouth. Some children had the habit of keeping food bolus in their mouth in between their teeth and cheeks for a long time before they swallowed it.

"when my son was young…I used sugar to brush his teeth so that he won't cry ..now my son brushes only once daily…that too he will do quickly and run…he is lazy to brush at night… we use tongue cleaners to clean our tongue…children sometimes do …sometimes we use midrib of coconut leaf also….my son keeps food in the mouth for a long time…between cheeks and teeth …he washes his mouth after breakfast and lunch…but after eating snacks he don't usually wash his mouth"

"my daughter sometimes brushes at night but sometimes she forgets to brush at night or she will feel sleepy and go to bed without brushing…I tell my daughter to use charcoal….cleaning teeth using charcoal applying finger pressure will help to reline the forwardly placed teeth…it will also whiten the teeth"

The findings regarding the oral hygiene habits of the children indicated that children needed reminders and motivation for twice daily tooth brushing, training regarding tongue cleaning technique and awareness regarding washing mouth always after food. Children and parents needed awareness regarding the detrimental effects of materials like charcoal, salt, pepper, tooth powder.

4.3.1.1.2.2. Dietary habits of children

Parents reported that most of the children ate the breakfast and the lunch given to them from the school. Children liked bakery foods, sweets, packed foods like 'kurkure', lays, 'ok byriyani' and packed juices like 'zip up'. During outings parents bought soft drinks for the children when they insisted.

"they like bakery foods and sweets…who don't like …they like to eat lays ..we tell them but when they insist sometimes we buy them pepsi or coca cola when we go out"

The findings regarding the dietary habits of the children indicated that children needed awareness regarding good dietary habits.

4.3.1.1.2.3. Dental problems seen in children

According to the parents, tooth pain, dental caries, bleeding from the gums, yellow color of teeth, decay of milk teeth, delayed shedding of deciduous teeth were the common dental problems in children. In order to get relief from tooth pain some parents and their children had adopted various tactics like salt water gargle, taking painkillers without consulting dentist, placing Vicks on the tooth, placing clove oil on tooth, placing axe oil on tooth, placing eucalyptus oil, placing a small yellow colored flower of a small locally available plant called 'ammachhi chedi' on the tooth

which will give a spicy feeling. Parents also reported that some of them applied an Ayurvedic medicine on their children's gums to get rid of bleeding from gums

"many children have decay in their teeth…yellow color of the teeth…retained milk teeth…to get relief from tooth pain…sometimes we apply Vicks on the tooth….from our parents' time when we get tooth pain we used to place the flower of 'ammachi chedi' on our tooth…it gives a spicy feeling…sometimes when children complain of tooth pain we do the same"

The findings regarding the common dental problems indicated that children and parents needed awareness regarding dental caries, gum diseases, importance of deciduous teeth and what to do when there is tooth pain or bleeding from gums

4.3.1.1.2.4. Absenteeism of children from school due to oral health problems

Some parents reported that their children had taken leave from school due to oral health problems. Most children had taken one to two days of leave due to oral health problems.

"sometimes they miss school…my son once had tooth pain….he missed two days of school due to that…we took him to dentist and did filling "

The findings regarding the absenteeism of the children from the school due to oral health problem indicated the need for oral health education intervention program for the children.

4.3.1.1.2.5. Nearby available dental care services

Government Dental College was the nearby available government dental care service but it was very difficult to get appointment from there. In case of emergency situations like trauma to the

teeth due to fall, parents took their children to the nearby private dental clinics but there the treatments were costly.

"mostly we take them to government dental college…but when my son fell down last year and broke his tooth we took him to the nearby private clinic…they said root canal treatment has to be done …we had to borrow money from my brother for that"

The findings regarding nearby available dental care services indicated that lack of available and affordable nearby dental care services affected the oral health care of the children.

4.3.1.1.2.6. Dental visits of children

Some children were not ready to go to the dental clinic because they were afraid of injection. Some children who had tooth decay but no associated pain were not ready to undergo dental treatment and their parents also allowed them to do so.

"my son has tooth decay but he won't go to the dentist….he said since he had no pain he won't come to see the dentist"

The findings regarding the dental visits of the children indicated that children need awareness regarding the importance of dental checkup and treatment.

4.3.1.1.2.7. Tobacco use among children

Most of the parents reported that children knew that tobacco products were bad. But some parents reported that for fun their children imitated how elders used tobacco products like 'Sambu'.

"my son sometimes imitates his father ...how his father uses 'Sambu'...how he places it in his mouth"

The findings that some children imitated how their elders used tobacco products like 'Sambu' indicated that children needed awareness regarding the detrimental effects of tobacco products.

4.3.1.1.2.8. Expectations regarding OHE class

Parents expected the OHE class to cover topics like tooth brushing technique, how much tooth paste must be taken, consequences of sugar consumption on teeth etc.

"correct brushing method....that is important.....my son takes only a little paste...tell them how much paste to take...how bad is sweets for their teeth....also children don't know the correct method of brushing....how much paste to take....even we are confused whether charcoal is good for teeth or not"

The expectations of the parents regarding the OHE class indicated that the OHE classes should cover topics like tooth brushing technique, how much tooth paste to be taken and effects of sugar on teeth.

4.3.1.1.2.9. Willingness of parents to be part of the program

Parents were interested to be part of the intervention program but many of them could not do so because of their work schedule. When we explored the possibility of conducting the OHE classes for parents along with the parents teachers association (PTA) meeting we found out that even for attending the PTA meeting the parents came at different time, some of them did not come for the

meeting. Parents reported that it would be useful if we could send pamphlets containing oral health information to them through children.

we would like to attend but due to the work-related issues all of them won't be able to make it…even for PTA meeting only 50% of parents come that too at different times…sending oral health information through pamphlets would be helpful"

These findings regarding the willingness of the parents to be part of the OHE program indicated that it would not be feasible to conduct OHE classes for the parents. So it was decided to send the oral health information containing pamphlets to the parents via their children.

4.3.1.1.2.10. Parents' opinion regarding the usefulness of brushing chart

Parents felt that brushing chart would be useful to remind their children regarding tooth brushing and children would be more interested to use the brushing chart if teachers motivated them to do so.

"children would be interested in using brushing charts…earlier they have been given hand washing charts they were useful…. children value what teacher says more than what we say…..so if teachers motivate them to use the brushing charts it would be more useful"

The parents' opinion regarding the usefulness of brushing chart indicated that brushing charts could be used as reminder for twice daily brushing and the encouragement from their teachers could be a good motivation for the children.

4.3.1.1.2.11. Parents' opinion regarding the use of mobile phone to reach out to them

Most of the parents used ordinary mobile phones, only a few of them had smart phones. Most of parents used phones for making and receiving calls; they did not have the habit of sending or reading messages.

"we have these ordinary phones…we don't usually send or check messages…. sometimes my daughter checks my messages…we just use phone for calling that is it"

The opinion of parents regarding the use of mobile phone to reach out to them indicated that the sending oral health information via short message service (SMS) to parents would not be useful.

4.3.1.1.3. Main findings from the FGDs with parents and teachers of 6-12 year old children

1. There was a need for an oral health education intervention program for the children.
2. Children needed awareness regarding
    - Good dietary habits
    - Washing mouth always after food
    - Dental caries and Gum diseases
    - Importance of deciduous teeth
    - What to do when there is tooth pain or bleeding from gums
    - The need for regular dental checkup
    - Detrimental effects of tobacco products
    - Importance of twice daily tooth brushing with tooth paste

- How much tooth paste must be taken
- Detrimental effects tooth cleaning with charcoal, salt, pepper, tooth powder.

3. Children needed training regarding
    - Tooth brushing technique
    - Tongue cleaning technique
4. The OHE classes should be conducted in the smart class rooms using laptops and projectors
5. The OHE classes should be conducted with help of 20 to 30-minute videos during the morning class hours
6. The main points of oral health information should be illustrated in charts and pasted in the classrooms as reminders for children.
7. Children needed reminders and motivation for twice daily tooth brushing
    - Brushing charts would be useful in reminding children regarding twice daily tooth brushing.
    - The encouragement from their teachers could be a good motivation for the children for twice daily tooth brushing.
8. In OHE program we could make use of the class teachers help for
    - Checking the brushing chart monthly
    - Reminding and encouraging the children regarding twice daily brushing.
9. Teachers needed awareness regarding the detrimental effects of charcoal on teeth
10. Conducting separate OHE classes for teachers would not be feasible due to the busy work schedule of the teachers. So, it was decided to distribute pamphlets with oral health information among the teachers.
11. Parents needed awareness regarding

- The importance of deciduous teeth
- The need of regular dental checkup
- What to do when there is tooth pain or bleeding from gums
- The detrimental effects of materials like charcoal, salt, pepper, tooth powder

12. Conducting OHE classes for the parents would not be feasible. Sending oral health information via short message service (SMS) to parents would not be useful. So it was decided to send the oral health information containing pamphlets to the parents via their children.
13. The lack of available and affordable nearby dental care services affected the oral health care of the children but this was beyond the scope of this intervention

4.3.1.2. In depth interviews (IDIs) parents of 6-12 year old children

The in depth interviews (IDIs) were with parents of children who had showed extremes of oral hygiene status in the baseline clinical oral examination; those children's baseline OHI-S score were either below 0.20 or above 4.5. Through IDIs we tried to understand the behaviors of the children responsible for their oral health status and the external factors beyond control of the children responsible for their behavior. IDIs were guided by theory of planned behavior, details of theory had been explained in the methods (section 3.5.1.4). Total of four IDIs were conducted, two of them were conducted with parents of children who showed good oral hygiene status and two of them were conducted with parents of children who showed poor oral hygiene status.

In the IDIs with parents we explored regarding the oral hygiene habits of the children, dietary habits of the children, tobacco use among children and the dental visits of the children to understand the children's attitude towards oral health related behavior (OHRB). We explored

regarding the parents' oral hygiene instructions to their children to get an idea regarding the subjective norm of the children with respect to the OHRB. We also enquired regarding the oral hygiene practices among parents and other their family members, common oral health complaints and dental visits among parents and other their family members, tobacco use among parents and other family members to get an idea regarding the descriptive norm of the children with respect to the OHRB. We also tried to find out how the parents taught tooth brushing to their children to get an idea regarding the perceived control the children had regarding their OHRB. Finally, we explored regarding the available nearby dental care services and the difficulties and challenges the parents faced in maintaining the oral health of their children to get an idea regarding the external factors that could affect the children's OHRB.

4.3.1.2.1. In depth interviews (IDIs) parents of 6-12 year old children who showed good oral hygiene status

4.3.1.2.1.1. Oral hygiene habits of children

Children brushed their teeth twice daily with tooth paste. In the morning children brushed their teeth after the breakfast and at night children brushed their teeth before going to bed. Children cleaned their tongue daily with tooth brush and changed their tooth brush in every one to two months. Children always washed their mouth after eating meals. After eating snacks, they would wash their mouth or drink water to keep their mouth clean.

" my son is generally very hygienic ...morning after getting up he cleans his mouth and teeth with just fingers then after breakfast he brushes his teeth…we use toothpaste and toothbrush….tongue cleaning is using tooth brush…earlier we used tongue cleaner….last year when we visited dentist for showing his teeth….doctor advised us not to use tongue cleaner…he told us to use toothbrush

to clean tongue after that we all use tooth brush to clean tongue. At night he brushes his teeth before going to bed…every one to two months he needs new tooth brush.

"my daughter…. she washes her mouth after every meal… when she eats snacks like puffs or cake also she washes her mouth… when we got out and if eats anything she will drink water from her bottle"

4.3.1.2.1.2. Dietary habits of children

Children ate the breakfast and lunch given to them from the school including the vegetable dishes. Children liked sweets and bakery foods but those foods items were not a compulsory need for them, they ate them only occasionally when the parents bought it for them. Children did not eat packet foods like lays, kurkure or drink soft drink like pepsi or coca cola.

"breakfast and lunch are from school… earlier it was difficult to get her have vegetables….now in the school along the other students … seeing them eating …now she also eats all the vegetable curry given from the school…she likes sweets and bakery food but they are not a must …she eats them when we buy those food items occasionally"

"he used to eat lays earlier …one day his elder sister after seeing a whatsapp message showed a piece of lays in candle flame and it melted like plastic and they understood I is not good… after that both of them stopped packet foods…he don't soft drinks like pepsi and coca cola …we don't buy also"

4.3.1.2.1.3. Tobacco use by their children

Children had never used any tobacco products. According to parents, children knew the ill effects of tobacco products even advised others regarding the same.

"they know the consequences…from television and advertisements …my daughter doesn't like its smell (cigarette smoke)……her gran father occasionally smokes cigarettes and one day when he visited our home she got its smell (cigarette smell) and she scolded him saying grandpa…you should not use cigarettes you will get cancer"

4.3.1.2.1.4. Dental visits of children

The parents had taken their children to dentists for teeth cleaning and filling of decayed teeth. Even though parents did take their children for regular dental checkup, whenever children had any oral health problem, they took them to dentist and the children were not afraid to visit the dentist.

"I have taken her to dentist for teeth cleaning and decay filling…. I haven't taken her for regular dental checkup but if she has any problem (oral health problem) I take her to dentist… we can't take risk with children (children's health) …she doesn't have any fear to go dentist"

4.3.1.2.1.5. Attitude of the children

The information form the parents regarding the oral hygiene habits of the children, dietary habits of the children, tobacco use among children and the dental visits of the children showed that children who had good oral hygiene status had a positive attitude towards the behaviors like twice daily tooth brushing with tooth paste, morning tooth brushing after breakfast, tongue cleaning with tooth brush, washing mouth always after taking food, following good dietary habits and dental visits etc which could improve their oral health.

4.3.1.2.1.6. Parents' oral hygiene instructions to their children

Parents reported that they had told their children to brush their teeth twice daily with tooth paste

and to do the morning tooth brushing after breakfast.

"from younger age itself I have told her that to keep our mouth clean we need to brush two times daily… morning after getting up just clean the mouth with water and finger….. tooth brushing is done after breakfast with tooth paste …then only food remains will also go"

4.3.1.2.1.7. Subjective norm

The information from the parents regarding the parents' oral hygiene instructions to their children gave us an idea regarding the subjective norm of the children. Children knew that twice daily tooth brushing with tooth paste and morning tooth brushing after breakfast would be the oral health related behaviors that would be appreciated by their parents.

4.3.1.2.1.8. Oral hygiene practices among parents and other family members of the children

Parents reported that they and family members also brushed their teeth twice daily with tooth paste and cleaned their tongue with tooth brush.

"in our home every one brushes their teeth two times daily with tooth paste…for tongue cleaning we all use tooth brush itself"

4.3.1.2.1.9. The common oral health complaints and dental visits among parents and other family members of the children

Tooth pain and dental caries were the common dental problems faced by parents and other family members. They had visited the dentist and undergone treatments like teeth fillings and teeth

extractions.

"I don't have much problem with my teeth...my husband had tooth pain … he had gone to dentist…I think two or three teeth were extracted…for one tooth root canal treatment was done"

4.3.1.2.1.10. Tobacco use among parents and other family members of the children

Parents reported that they or their family members living in their home did not use any kinds of tobacco products, but some of their relatives occasionally used tobacco products.

"no one in our home uses tobacco…my husband does not smoke or drink(alcohol)… my father occasionally smokes cigarettes, but he doesn't live with us he lives in my native place with my mother"

4.3.1.2.1.11. Descriptive norm

The information from the parents regarding the oral hygiene practices among parents and other their family members, common oral health complaints and dental visits among parents and other their family members, tobacco use among parents and other family members gave us an idea regarding the descriptive norm of the children. The findings indicated that the parents' habits like the twice daily tooth brushing with tooth paste, tongue cleaning using tooth brush and their dental visits to address their dental problems, all have influenced the oral health related behavior of their children.

4.3.1.2.1.12. How parents taught tooth brushing to their children

Parents reported had taught their children to brush their teeth in up and down direction. Tooth paste

was introduced after the parents were sure that the children knew how to spit. Children started brushing their teeth by themselves when they were three or four years old. Parents had told children to take tooth paste about half the length of the tooth brush head. Once in a week they checked their children's mouth to see whether the mouth is clean or not.

"I taught him how to brush the teeth in up and down direction ...so I always told him to do like that.... I gave him tooth paste only after I was sure he knew how ti spit the lather out"

"..she started brushing by her own when she was three or four years...I have told her not take too much tooth paste, only to take half the length of tooth brush head ...once in a week I check her mouth... sometimes if I feel it is not cleaned properly in the inside...I will show her in the mirror so that she will brush properly if needed I will also help her"

4.3.1.2.1.13. Perceived control

The information from the parents regarding how they taught tooth brushing to their children gave us an idea regarding the perceived control children had regarding their oral health related behavior. The parents had trained their children regarding tooth brushing technique and the amount of tooth paste to be taken during tooth brushing. The training and regular support from their parents had helped the children to have more control over their tooth brushing skills.

4.3.1.2.1.14. Available nearby dental care services

The nearby dental care services included government and private sector services. The government sector included the Taluk hospital and the Government Dental College. Private sector included Private Dental College and nearby private clinics. Parents reported that they mostly went to the Taluk hospital or Government Dental College for treatment, but they had taken their children to

private clinics even though the treatment was costly, because in Government Dental College there was delay in getting appointments and many visits were needed and it affected the children's school attendance.

"When my daughter had tooth problem, I took her to private clinic because to get an appointment in Government Dental College is very difficult…there will be delay… we have to go several times… her class…so I took her to nearby private clinic even though it was costly"

4.3.1.2.1.15. The difficulties and challenges parents faced in maintaining the oral health of their children

Parents reported that the only difficulty they faced in maintaining the oral health of their children was to depend on costly private clinics due to the delay in getting appointment in Government Dental College.

"as I have said earlier in Government Dental College you have to wait to get an appointment…so we have to go private clinics…which is costly…other than that no problem till now"

4.3.1.2.1.16. External factors

The information from the parents regarding the available nearby dental care services and the difficulties and challenges they faced in maintaining the oral health of their children gave us an idea regarding the external factors affected the children's oral health related behavior (OHRB). Due to the delay in getting appointment from government sector they had to depend on private sector which was costlier. Reducing the delay in providing services in the government sector could have improved the dental visits of the children which was an important component of the OHRB of the children.

4.3.1.2.1.17. Oral health related behavior of children who showed good oral hygiene status in baseline clinical oral examination

In depth interviews with the parents of the children who showed good oral hygiene status showed that the positive attitude of those children towards good OHRB, their parents' instructions regarding oral health related behaviors (OHRB), their observation of their parents' OHRB, their parents training and support for performing OHRB had helped them to perform their OHRB leading to good oral health. The OHRB of the children included twice daily tooth brushing with tooth paste, morning tooth brushing after breakfast, tongue cleaning with tooth brush, washing mouth always after food, good dietary habits and dental visits when there was an oral health problem. The external factors which affected the children's OHRB was lack of available and affordable nearby dental care services (Figure 10).

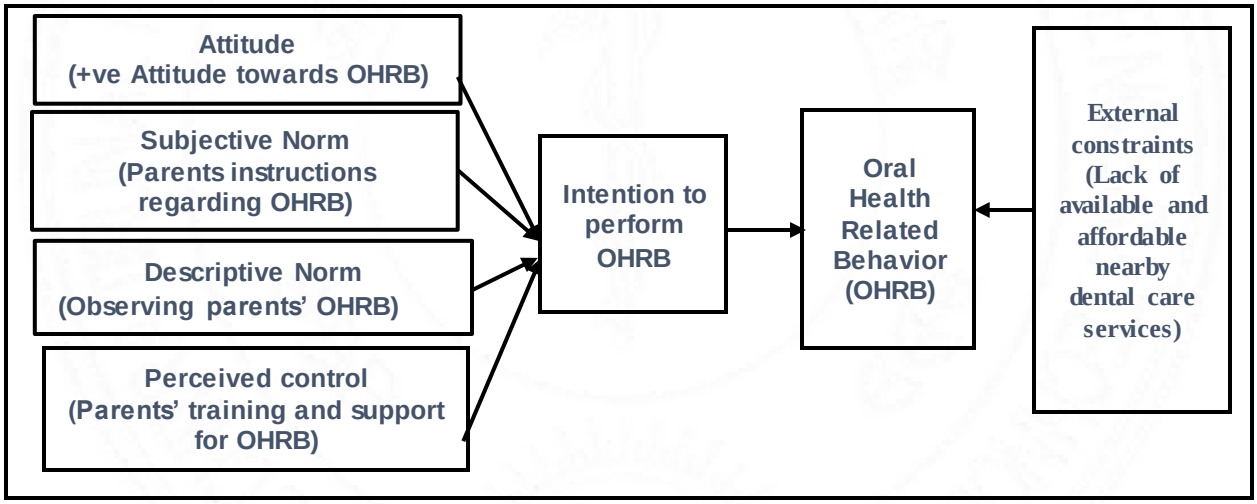


Figure 10: Oral health Related Behavior (OHRB) of children who showed good oral hygiene status in baseline clinical oral examination based on Theory of planned behavior (modification).
Adapted from Health behavior and Health education 5th edition

4.3.1.2.2. In depth interviews (IDIs) parents of 6-12 year old children who showed poor oral hygiene status

4.3.1.2.2.1. Oral hygiene habits of children

Children brushed their teeth once daily with tooth paste. In the morning the children brushed their teeth before breakfast. The children did not brush their teeth at night either because of laziness or sleep, but sometimes the children brushed their teeth at night when their parents reminded them. The children occasionally cleaned their tongue with tongue cleaner and changed their tooth brush when the bristles wear doff. Even though children washed their mouth after taking main meals, they did not always wash their mouth or drink water after they ate snacks.

"morning he brushes ... we use tooth paste…. but at night it is difficult to get him brush his teeth…main reason is that he is lazy…or he will tell he is feeling sleepy… he changes his tooth brush when the bristles weredoff"

"My daughter is very hesitant to do tongue cleaning… sometimes she does…. we use tongue cleaner she washes her mouth after meals, but after snacks it is very rare, sometimes she drinks water after eating snacks"

4.3.1.2.2.2. Dietary habits of children

During school days children ate the breakfast and lunch given from the school. Children ate only the vegetable dishes they liked like beetroot and carrot dishes. They liked sweets and bakery foods items very much. Occasionally they drank soft drinks like pepsi and coca cola. Children also liked packet food items like lays, kurkure, 'ok byriyani' and zip up and most days children bought them from shops near the school.

"...from the school they give breakfast and lunch…their they give different types of vegetable

dishes, but she is very choosy...she likes only beetroot and carrot dishes so eats them only…she likes sweets and bakery food items very much…sometimes when we go out we buy soft drinks like pepsi or coca cola and she also drinks it"

"…My son like packet food items like kurkure, layz, ok byritani and zip up …he buys them from shops near the school …they are very cheap …'ok byriyani' cost about five rupees and zip up about one rupee"

4.3.1.2.2.3. Tobacco use by their children

Children did not use any tobacco products. But sometimes for fun children imitated how elders used tobacco products like 'Sambu'.

"My son had never used any tobacco products…but in our home his father uses 'sambu'… my son sometimes imitates his father for fun…showing how he places 'sambu' in his mouth and all"

4.3.1.2.2.4. Dental visits of children

The parents had taken their children to dentists for teeth extraction and after that children were afraid of injections and feared to go to dentist. Parents did not take their children for regular dental checkup.

"I have not taken my son for regular dental checkup. I have taken him to dentist for teeth extraction…it was a mess…the injection and all...now he fears to go to dentist"

4.3.1.2.2.5Attitude of the children

The information form the parents regarding the oral hygiene habits of the children, dietary habits of the children, tobacco use among children and the dental visits of the children showed that

children who had poor oral hygiene status lacked a positive attitude towards the behaviors like twice daily tooth brushing with tooth paste, morning tooth brushing after breakfast, tongue cleaning with tooth brush, washing mouth always after taking food, following good dietary habits, dental visits etc which could improve their oral health.

4.3.1.2.2.6. Parents' oral hygiene instructions to their children

Parents reported that they had told their children that it was important to brush their teeth in the morning before breakfast. They also reported that even though they had told their children regarding brushing their teeth in the night, sometimes only children would follow their advice.

"I have told him that it is important to brush his teeth in the morning before breakfast….I have had told him about night brushing also but he does that only sometimes"

4.3.1.2.2.7. Subjective norm

The information from the parents regarding the parents' oral hygiene instructions to their children gave us an idea regarding the subjective norm of the children. Since morning tooth brushing before breakfast was given more importance and insistence by the parents compared to night tooth brushing children thought that morning tooth brushing before breakfast was the OHRB that would be appreciated by their parents.

4.3.1.2.2.8. Oral hygiene practices among parents and other family members of the children

Parents and other family members brushed their teeth in the morning with tooth paste. Most of them did not brush their teeth at night or cleaned their tongue. Some of them occasionally used

mixture of charcoal and salt to clean their teeth.

"In my family we all brush our teeth with tooth paste in the morning ....I brush my teeth in the night also…and I clean my tongue daily with tongue cleaner. My husband brushes his teeth only once daily and he do not clean his tongue…my mother in law occasionally uses mixture of charcoal and salt to clean her teeth"

4.3.1.2.2.9. The common oral health complaints and dental visits among parents and other family members of the children

Tooth pain, dental caries and bleeding from gums were the common dental problems faced by parents and other family members. Some of them had delayed their dental visits till their oral health problem became worse, some had taken medicines without consulting the dentist, some had visited the dentist and undergone treatments like teeth fillings and teeth extractions.

"My husband had many decayed teeth…when he gets tooth pain he will take a painkiller from the medical shop and if the pain does not go, as a last resort he would go to the dentist and get his teeth extracted

4.3.1.2.2.10. Tobacco use among parents and other family members of the children

Parents reported that some of the family members used tobacco products like 'sambu' to get relief from their work stress.

"my husband is a daily wage worker…to get relief from his work stress he uses tobacco products like 'sambu' since last six –seven years"

4.3.1.2.2.11. Descriptive norm

The information from the parents regarding the oral hygiene practices among parents and other their family members, common oral health complaints and dental visits among parents and other their family members, tobacco use among parents and other family members gave us an idea regarding the descriptive norm of the children. It findings indicated that the parents' lack of habits like twice daily tooth brushing with tooth paste, morning tooth brushing after breakfast, tongue cleaning with tooth brush, and dental visits to address their dental problems, all have influenced the OHRB of their children.

4.3.1.2.2.12. How parents taught tooth brushing to their children

Children brushed their teeth sideways and they learned tooth brushing by watching their parents brush their teeth. Tooth paste was introduced to the children after the parents were sure that the children knew how to spit. Most of the children started brushing their teeth by themselves when they were three or four years old. Since parents were busy with their work and household chores, they did not get time to check their children's mouth to see whether the mouth was clean or not.

"we did not do anything particular to teach brushing to our children....they just learned brushing by watching us brushing our teeth....we brush our teeth sideways...she started brushing by her own when she was three or four years...I don't get time to check her mouth due to my household work"

4.3.1.2.2.13. Perceived control

The information from the parents regarding how they taught tooth brushing to their children gave us an idea regarding the perceived control children had regarding their oral health related behavior.

The finding that the children brushed their teeth sideways and they learned tooth brushing by themselves without parents' regular support indicated that children had inadequate tooth brushing skills.

4.3.1.2.2.14. Available nearby dental care services

The nearby dental care services included government and private sector services. The government sector included the Taluk hospital and the Government Dental College. Private sector included Private Dental College and nearby private clinics. In the Taluk hospital extraction is done only on one of the weekdays leading to long waiting hours. Long waiting time made the children stressed, later the site of needle increased their fear so they started crying and the treatments were completed with great difficulty and children were afraid to make further dental visits.

"In Taluk hospital tooth extraction are done only during Wednesdays, .once I had taken my son for extraction…waiting in the lobby he heard other children crying inside…that made him stressed … once he entered the clinic the site of the needle increased his fear and he started crying…it was a mess …the doctor somehow managed to complete the procedure, after that he is very much afraid to visit dental clinics"

4.3.1.2.2.15. The difficulties and challenges parents faced in maintaining the oral health of their children.

Parents reported that the long waiting time in the government dental hospitals was the difficulty they encountered. Due to lack of time because of household work some parents were not able to give enough attention to their children's oral health needs.

"for me long waiting hours outside government dental hospital was a challenge I feel that I due

to my household work I don't get enough time to take care of my daughters' oral health"

4.3.1.2.2.16. External factors

The information form the parents regarding the available nearby dental care services and the difficulties and challenges they faced in maintaining the oral health of their children gave us an idea regarding the external factors that affected the children's OHRB. Long waiting time in government dental hospitals and lack time from parents' part were the external factors that affected the children's OHRB.

4.3.1.2.2.17. Oral health related behavior of children who showed poor oral hygiene status in baseline clinical oral examination

In depth interviews with the parents of the children who showed poor oral hygiene status showed that lack of positive attitude of those children towards OHRB, lack of proper instructions from their parents' regarding OHRB, their observation of their parents' poor OHRB, lack of proper training and support from their parents for performing OHRB had intended them to perform their OHRB leading to poor oral health. The OHRB of the children included once daily tooth brushing with tooth paste in sideways direction, morning tooth brushing before breakfast, occasional tongue cleaning with tongue cleaner, not always washing mouth after food, poor dietary habits and irregular dental visits. Long waiting time in government dental hospitals and lack time from parents' part were the external factors that affected the children's OHRB (Figure 11).

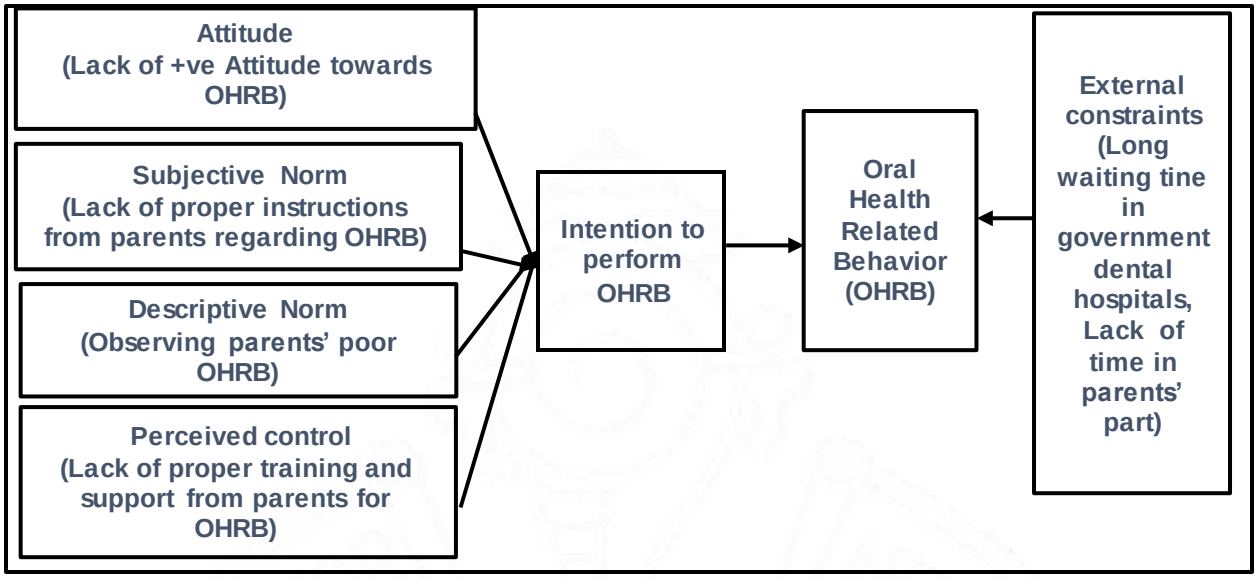


Figure 11: Oral health Related Behavior (OHRB) of children who showed poor oral hygiene status in baseline clinical oral examination based on Theory of planned behavior (modification).
Adapted from Health behavior and Health education 5th edition

4.3.1.3. Behavioral and environmental assessment

In depth interviews with the parents of children who had showed extremes of oral hygiene status in the baseline clinical oral examination helped to achieve behavioral and environmental assessment part of the phase 2 of PRECEDE–PROCEED model. The IDIs with parents helped us to understand the oral health related behaviors (OHRB) of those children responsible for their oral health status and the external factors which affected their oral health. The OHRB and the external factors gave us indications for the intervention program (Table 55,56).

Table 55: OHRB and external factors affecting oral health of children with good oral hygiene status in baseline clinical oral examination and their indications for intervention program

OHRB and external factors affecting oral health of children with good oral hygiene status in baseline clinical oral examination and their indications for intervention program	
Oral health related behaviors (OHRB)	**Indications for intervention program**
Twice daily tooth brushing with tooth paste	Reinforcement
Morning tooth brushing after breakfast	Reinforcement
Tongue cleaning with tooth brush	Reinforcement
Washing mouth always after food	Reinforcement
Good dietary habits	Reinforcement
Dental visits when there was an oral health problem	Awareness regarding the importance of regular dental checkups
External factors	
• Lack of available and affordable nearby dental care services • Delay in getting appointment in government dental facilities • Costly private dental facilities	All were beyond the scope of intervention

Table 56: OHRB and external factors affecting oral health of children with poor oral hygiene status in baseline clinical oral examination and their indications for intervention program

OHRB and external factors affecting oral health of children with poor oral hygiene status in baseline clinical oral examination and their indications for intervention program	
Oral health related behaviors (OHRB)	**Indications for intervention program**
Once daily tooth brushing with tooth paste in sideways direction	Awareness regarding twice daily tooth brushing Training on tooth brushing technique
Morning tooth brushing before breakfast	Awareness regarding morning tooth brushing after breakfast
Occasional tongue cleaning with tongue cleaner	Training on tongue cleaning technique
Not always washing mouth after food	Awareness regarding the importance of always cleaning the mouth after food
Poor dietary habits	Awareness regarding good dietary habits
Irregular dental visits	Awareness regarding the importance of regular dental checkups
External factors	
Long waiting time in government dental hospitals Lack time from parents' part	Beyond the scope of intervention Beyond the scope of intervention

4.3.2. Intervention Development

The school oral health education intervention program was developed based on the results of the baseline quantitative data analysis and the results of qualitative data analysis from phase 1. The results of the baseline data analysis gave us the epidemiological assessment (Table 31), predisposing factors (Figure 9), reinforcing and enabling factors (Table 33). Qualitative data of phase 1 came from FGDs with parents and teachers of 6-12 year old children (section 4.3.1.1.3)

and IDIs with parents of children who showed extremes of oral hygiene status in the baseline clinical oral examination (Table 55 and 56). The combined information from all these results gave us the areas in which children needed awareness, the area in which children needed training, how to conduct OHE classes and a lot of other information.

4.3.2.1. The combined information developed based on the results of the baseline quantitative data analysis and the results of qualitative data analysis from phase 1

1. There was a need for an oral health education intervention program for the children.
2. Children needed awareness regarding
    - Good dietary habits
    - Washing mouth always after food
    - Dental caries and gum diseases
    - Importance of deciduous teeth
    - How oral health and general health are related
    - What to do when there is tooth pain or bleeding from gums
    - The need for regular dental checkup every six months
    - Detrimental effects of tobacco products
    - Importance of twice daily tooth brushing with tooth paste
    - Importance of morning tooth brushing after breakfast
    - How much tooth paste must be taken and when to change the tooth brush

- Detrimental effects of tooth cleaning with charcoal, salt, pepper, mango leaf, tooth powder.

3. Children needed training regarding
    - Tooth brushing and tongue cleaning technique
4. The OHE classes should be conducted in the smart class rooms using laptops and projectors
5. The OHE classes should be conducted with help of 20 to 30 minute videos during the morning class hours
6. The main points of oral health information should be illustrated in charts and pasted in the classrooms as reminders for children.
7. Children needed reminders and motivation for twice daily tooth brushing
    - Brushing charts would be useful in reminding children regarding twice daily tooth brushing.
    - The encouragement from their teachers could be a good motivation for the children for twice daily tooth brushing.
8. In OHE program we could make use of the class teachers help for
    - Checking the brushing chart monthly
    - Reminding and encouraging the children regarding twice daily brushing.
9. Teachers needed awareness regarding the detrimental effects of charcoal on teeth
10. Conducting separate OHE classes for teachers would not be feasible due to the busy work schedule of the teachers. So it was decided to distribute pamphlets with oral health information among the teachers.
11. Parents needed awareness regarding
    - The importance of deciduous teeth

- The need of regular dental checkup
- What to do when there is tooth pain or bleeding from gums
- The detrimental effects of materials like charcoal, salt, pepper, tooth powder

12. Conducting OHE classes for the parents would not be feasible. Sending oral health information via short message service (SMS) to parents would not be useful. So it was decided to send the oral health information containing pamphlets to the parents via their children.
13. If children already followed good oral health behaviors like twice daily tooth brushing with tooth paste, morning tooth brushing after breakfast, tongue cleaning with tooth brushing washing mouth always after food and good dietary habits those oral health behaviors had to be reinforced by ensuring them via the OHE classes that they are doing the correct thing.
14. The lack of available and affordable nearby dental care services, lack of time from parents' part and long waiting time in government dental hospitals affected the oral health care of the children; but these were external factors beyond the scope of this intervention.

The combined information developed based on the results of the baseline quantitative data analysis and the results of qualitative data analysis from phase 1 was used for the development of the school oral health education intervention program. Decision regarding actions to be taken as part of the OHE program based on the key concepts of the Health Belief Model (Table 57).

Table 57: Decision regarding actions to be taken as part of the OHE program based on the key concepts of the Health Belief Model

Concept	Definition	Decisions reading actions to be taken for the OHE program
Perceived susceptibility	Belief about the likelihood of experiencing a risk or getting a condition or disease	➢ It was decided to make the children aware that their unhealthy oral health behaviors had worsened their oral hygiene status and made them more susceptible to tooth decay and gum diseases. ➢ The unhealthy oral health behaviors of children included • Poor dietary habits • Not always washing mouth after food • Not going for regular dental checkups • Not visiting dentist when they experience tooth pain or bleeding from gums • Not following correct tooth brushing technique • Avoiding tooth brushing at night • Doing mooring tooth brushing before breakfast • Not taking correct amount of tooth paste • Using materials other than tooth brush and tooth paste to clean their teeth • Using tooth brush for more than three months • Avoiding tongue cleaning • Tongue cleaning using things other than tooth brush
Perceived severity	Belief about how serious a condition become if left untreated that is its clinical and social sequelae	➢ Through OHE classes it was decided to give children awareness regarding • Importance of teeth – its social sequelae • Tooth decay – its clinical sequelae • Gum diseases - its clinical sequelae • How oral diseases affect general health
Perceived benefits	Belief in efficacy of the advised action to reduce risk	➢ Through OHE classes it was decided to make the children aware that following good oral health behaviors would improve their oral hygiene status and make them less susceptible to tooth decay and gum diseases. ➢ The good oral health behaviors included • Twice daily teeth cleaning with tooth brush and tooth paste.

		• Doing morning tooth brushing after breakfast. • Following correct tooth brushing technique • Taking correct amount of tooth paste • Avoid using materials other than tooth brush and tooth paste to clean their teeth • Changing tooth brush every three months • Daily tongue cleaning using tooth brush • Tongue cleaning using things other than tooth brush • Good dietary habits • Always washing mouth after food • Going for regular dental checkups every six months • Visiting dentist if you experience tooth pain or bleeding from gums • Avoid tobacco products
Perceived barriers	Belief about the tangible and psychological costs of the advised action	➢ The main barrier which lead to unhealthy oral health behavior was misinformation among children, parents and teachers. ➢ Through OHE classes it was decided to provide awareness to children to correct the misinformation they had. ➢ Through pamphlets it was decided to provide awareness to parents and teachers to correct the misinformation they had. ➢ Children, parents and teachers needed awareness regarding the following topics to correct the misinformation they had • Morning tooth brushing is better for oral health • The importance of deciduous teeth • The need of regular dental checkup every six months • The need for visiting dentist if they experienced tooth pain or bleeding from gums • The detrimental effects of tooth cleaning with materials like charcoal, salt, pepper, tooth powder
Cues to action	Strategies to activate "readiness"	➢ The children needed motivation and reminders to follow good oral health behaviors. ➢ It was decided that

		• The charts containing oral health education information would be pasted in the classrooms to remind the children regarding the main points of oral health information. • Monthly brushing charts would be used to remind the children regarding twice daily tooth brushing • Class teachers' help would be sought to ✓ encourage children to do twice daily tooth brushing. Encouragement from their class teachers would be a good motivation for the children. ✓ check the brushing charts monthly. 'Good' comment and 'star mark' on the brushing chart by the class teacher would act as positive reinforcements for twice daily brushing.
Self-efficacy	Confidence in one's ability to take action	➢ It was decided that in order to increase children's ability and confidence in performing daily oral hygiene activities they would be given training in the following areas • Tooth brushing technique • Tongue cleaning technique

4.3.2.2. Components of the oral health education intervention program

The components of the oral health education intervention program included the OHE classes and the OHE materials.

4.3.2.2.1. The Oral health education classes

The oral health education classes were conducted with help of OHE video, tooth brushing model and tooth brush.

A 20 minutes oral health education video including all the topics on which the children needed awareness was developed to help to conduct OHE classes. Topics included were importance of teeth; importance of deciduous teeth; causes, symptoms, sequelae and prevention of dental caries and gum diseases; how oral health is related to general health; dietary habits good for oral health;

dietary habits bad for oral health; importance of twice daily tooth cleaning with tooth brush and tooth paste; importance of morning tooth brushing after breakfast; tooth brushing technique detrimental effects of tooth cleaning with materials like charcoal, salt, pepper, tooth powder; when to change tooth brush; how much tooth paste to be taken; tongue cleaning technique; importance of washing mouth after meals and snacks; what to do and what not to do if you experience tooth pain or bleeding from gums; importance of reduced intake of sweets, packed food items, packet juices and soft drinks; harmful effects of tobacco; importance of regular dental checkups every six months. All these topics were covered in a simple manner in the video with the help of cartoons and pictures. Video had an attractive background music to retain attention of the children. The slides used to make the video are given in Appendix 30.

The tooth brushing model and tooth brush (Appendix 31) were used to demonstrate the tooth brushing technique and tongue cleaning technique to the children. Modified Bass brushing technique was demonstrated. The Modified Bass brushing technique is the most widely accepted and most effective method of brushing (Poyato-Ferrera et al. 2003). The children practiced the tooth brushing technique and tongue cleaning technique using the tooth brushing model and tooth brush.

4.3.2.2.2. The Oral health education materials

The oral health education materials developed for the intervention program included charts, pamphlets and brushing charts. All the OHE materials were prepared in the local language Malayalam and made attractive with pictures and cartoons.

A total of four charts were developed (Appendix 32i -32iv). First two charts included the main points of all the topics which were covered in the OHE class. The third chart illustrated the brushing technique. The fourth chart dealt with the shedding time of deciduous teeth and eruption time of permanent teeth. One pamphlet was developed, with information printed on both sides of it (Appendix 33i -33ii). Main points of all the topics which were covered in the OHE class, illustration of the brushing technique, the shedding time of deciduous teeth and eruption time of permanent teeth were all included in the pamphlet also. Monthly brushing charts (Appendix 34) which were developed as part of the OHE program had boxes for the children to put tick mark after they did tooth brushing during morning and at night. There were also boxes where the class teachers could write their comment and to put 'star mark'.

The process of implementation of the intervention program had been described in detail in the methods section 3.5.2.

4.3.3. Results of the qualitative data analysis from phase 3

Qualitative data in phase 3 in this study came from the FGDs with parents and teachers of children in the intervention group

4.3.3.1. FGDs with parents and teachers of children in the intervention group

FGDs were conducted based on the principles of participation and relevance. The FGDs helped us to understand regarding the usefulness of the program and the suggestions for the improvement of the program gathering information directly from their parents and teachers of children in the intervention group.

4.3.3.1.1. Focus group discussions (FGDs) with teachers of children in the intervention group

A total of three FGDs were conducted with the teachers. FGDs were conducted to understand the experience the children shared with them regarding the OHE program, changes they had noticed in the oral hygiene habits of the children during intervention period, usefulness of OHE materials like pamphlets and monthly brushing chart. We also tried to understand the teachers' opinion on the OHE program, their suggestions for improving the program and their opinion regarding the need for such OHE intervention programs in future.

4.3.3.1.1.1. The children's experiences regarding the OHE program

The OHE classes were interesting for the children. Since the children practiced the tooth brushing technique using model and tooth brush they easily picked up the tooth brushing technique. New information was explained to the children in a simple way so that children could understand and accept it. The information on benefits of morning tooth brushing after breakfast and the detrimental effects of tooth cleaning with charcoal, salt, pepper and tooth powder were new for most of the children but they were able to accept it.

" children were happy that all of them got a chance to practice tooth brushing in the model…those practical things makes learning easy…so they picked up the brushing technique quickly…classes were interesting for them… …things like morning tooth brushing after breakfast and bad effects of charcoal were new for them …but in the classes things were explained to them so they understood"

The findings on children's experiences regarding the OHE program indicated that the OHE program was useful in providing tooth brushing training to children. The OHE program was also useful in providing awareness to children regarding the benefits of morning tooth brushing after breakfast and the detrimental effects of tooth cleaning with charcoal, salt, pepper and tooth powder.

4.3.3.1.1.2. Changes in the oral hygiene habits of the children during intervention period

Children started brushing their teeth twice daily. Now after eating snacks most of the children washed their mouth and if that was not possible, they drank water from their water bottles. Most children had reduced or stopped the use of packed food items like lays, kurkure and packet juice items like 'zip up".

"now most of children brush their twice daily…we ask them and tell to do night brushing …so most them now brush at night I have noticed that children have started washing their mouth after eating snacks….sometimes they drink water from the bottle after eating birthday sweets during intervals… in my class now children don't buy lays or 'zip up' after school"

The findings regarding the changes in the oral hygiene habits of the children indicated that the OHE program has improved the oral hygiene habits of children including their tooth brushing habits, mouth washing habits after eating food and their dietary habits.

4.3.3.1.1.3. Usefulness of OHE materials

Teachers reported that the pamphlets were very useful. Teachers got new information from pamphlets like morning tooth brushing after breakfast was better for oral health and charcoal

caused detrimental effects on teeth. Charts helped the children to remind the main pain points of the OHE classes. The charts were very colorful and attractive and teachers had seen the children observing and discussing about the charts during interval time; especially regarding the chart demonstrating the brushing technique. Class teachers checked the brushing charts monthly. Most of the children had started to brush twice daily. Children were very excited about the brushing charts and about receiving 'Good' comment and 'star mark' on the brushing chart from the teachers

"pamphlets were very useful… we got many new information…earlier we thought charcoal was good for teeth and we also thought that at morning we should brush before breakfast but now we know that thoughts were not correct….during interval time I have seen children looking at the charts and talking about them…

brushing charts were very useful …we checked the brushing charts monthly…. they (children) like to be appreciated…..'Good comment'…..'star mark'…..all encouraged them to brush their teeth twice daily"

The findings regarding the OHE materials indicated that the pamphlets provided oral health related information to the teachers especially regarding detrimental effects of charcoal and that morning tooth brushing after breakfast was better for oral health. The charts reminded the children regarding the main points of the OHE information. Brushing charts reminded the children regarding twice daily tooth brushing. Class teachers checked the brushing charts monthly. 'Good' comment and 'star mark' on the brushing chart by the class teacher acted as positive reinforcements for twice daily brushing.

4.3.3.1.1.4. Teachers' opinion regarding the OHE program

The OHE program was useful for the children. Through the program children learned many new things. The OHE program provided oral health related information to children and teachers. The program improved the oral hygiene habits of the children.

"program was good…children learned many new things like correct brushing method… we also got many new oral health related information…now most of the children brush twice daily...that is a big thing"

Teachers' opinions regarding the OHE program indicated that the program was useful for the children.

4.3.3.1.1.5. Teachers' suggestions for improving the OHE program

According to teachers if OHE classes could be conducted at regular intervals for the children even after the intervention program the children won't forget what they have learned. Many teachers reported that providing OHE training to teachers would be helpful because when the intervention program stops the teachers could help the children to continue their OHE classes. Some teachers reported that it would be good if a doubt clearing session could be arranged for the parents and teachers were, they could clear their oral health related doubts.

"after program ends also…if you could arrange classes for children at regular intervals, it would be good…children won't forget what they have learned….raining teachers to take oral health classes would be good so that we can help the children even after the program is over…..also if possible a session should be organized to clear the doubts of parents and teachers regarding oral health problems"

Suggestions put forward by teachers for improving the OHE program included continuing conducting OHE classes at regular intervals, training teachers to take OHE classes for the children and conducting oral health related doubts clearing session for parents and teachers

4.3.3.1.1.6. Teachers' opinion regarding the need for such OHE intervention programs in future

Teachers reported that there was a need for similar OHE programs. Future programs should involve all the children in the school and teachers liked to be part of such programs.

"there should be more programs like this…new programs should involve all the children …all children should get the benefits of such classes…we are also ready to be part of such programs"

Teachers' opinions regarding the need for OHE programs in the future indicated that there was a need for similar OHE programs in the future. New programs should involve more children and teachers were ready to be part of such OHE programs.

4.3.3.1.2. Focus group discussions (FGDs) with parents of children in the intervention group

A total of four FGDs were conducted with the parents. FGDs were conducted to understand the experience the children shared with them regarding the OHE program, changes they had noticed in the oral hygiene habits of the children during intervention period, usefulness of OHE materials like pamphlets and monthly brushing chart. We also tried to understand the parents' opinion on the OHE program, their suggestions for improving the program and their opinion regarding the need for such OHE intervention programs in future.

4.3.3.1.2.1. The children's experiences regarding the OHE program

Children liked to attend the OHE classes. Children learned about tooth decay, gum diseases and the effect of oral diseases on general health from the OHE classes. Children became aware that they had to visit a dentist if they had tooth pain or bleeding from gums. They understood that not only cigarette but also tobacco products like 'Smabu' could cause disease like oral cancer.

"my son told me amma…. doctor told us about tooth decay…how germs causes tooth decay…and gum bleeding... amma…dental diseases can affect our stomach, heart …doctor told us to go to dentist if there is tooth pain or bleeding from gums …we should not put axe oil on tooth, it is bad for teeth.. he also told my husband that things like 'Sambu' are bad and it cause cancer...my husband has now stopped using 'Sambu' in front of my son"

The findings on children's experiences regarding the OHE program indicated that the OHE program was useful in providing children awareness regarding dental caries, gum diseases, how oral health and general health are related, what to do if there they have tooth pain or bleeding from gums and also awareness regarding detrimental effect of tobacco products.

4.3.3.1.2.2. Changes in the oral hygiene habits of the children during intervention period

Most of the parents reported that their children had started brushing their teeth twice daily and cleaning their tongue with tooth brush. Children had changed their old tooth brushes. According to parents, children now know that they have to change their tooth brush once in every three months. The children had also stopped using materials like charcoal, salt, pepper, tooth powder etc

for cleaning teeth and they were using only tooth paste. According to the parents, children took adequate amount of tooth paste to clean their teeth.

"Nowadays my son brushes at night also…he puts tick mark in the chart…we he excited about that…. now he cleans his tongue also with tooth brush he took a new tooth brush also…earlier he changed the brush only when the bristles weardoff"

"my daughter came home and told me …. amma…doctor told us not to use charcoal, it is bad for teeth…now she uses tooth paste only that too only about half the size of the brush (brush head)"

The findings regarding the changes in the oral hygiene habits of the children during the intervention period indicated that the OHE program has improved the oral hygiene habits of children including their tooth brushing habits and tongue cleaning habits. The OHE classes also provided children awareness regarding the detrimental effects of charcoal, salt, pepper, tooth powder, awareness regarding when to change the tooth brush and awareness regarding how much tooth paste must be taken.

4.3.3.1.2.3. Usefulness of OHE materials

Pamphlets were very useful. Parents got new information from pamphlets like morning tooth brushing after breakfast was better for oral health and charcoal, salt, pepper, tooth powder etc. caused detrimental effects on teeth. The information on the importance of deciduous teeth, importance of regular dental checkup, the shedding time of deciduous teeth, eruption time of permanent teeth, the need to visit a dentist if they or their children experienced tooth pain or bleeding from gums instead of trying local tactics etc. were helpful for many parents. Brushing charts reminded children regarding twice daily brushing, especially night brushing.

"*from my childhood itself it was said that charcoal, pepper and salt mixture will help to whiten the teeth. .... now I know that is not correct… from the pamphlets we got to know that we have to take good care of children's milk teeth also…the information on the shedding time of deciduous teeth and eruption time of permanent teeth were also very useful… I used to tell my daughter to place axe oil on her tooth when she had tooth pain…if pain did not go then only, I thought about going to dentist…now I know that I should take her to dentist as early as possible. My daughter ticks the brushing chart every time after brushing…she tells that teacher will ask…she has to show the chart to the teacher…she was very excited for that"*

The findings regarding the OHE materials indicated that the pamphlets provided oral health related information to the parents including the detrimental effects of charcoal on teeth, the importance of deciduous teeth, the need of regular dental checkup, and the need to visit a dentist when they or their children experienced tooth pain or bleeding from gums. Brushing charts reminded the children regarding twice daily tooth brushing.

4.3.3.1.2.4. Parents' opinion regarding the OHE program

Parents reported that the OHE program was useful for the children. Children were interested in the classes and learned many new things. The OHE program provided oral health related information to children and parents. The program had improved the oral hygiene habits of the children.

"program was very useful… my daughter learned many things like brushing method, how much paste to be taken…we also got many information from the notice(pamphlet)"

Parents' opinions regarding the OHE program indicated that the program was useful for the children.

4.3.3.1.2.5. Parents' suggestions for improving the OHE program

Parents reported that continuing the OHE classes at regular intervals would be useful so that children won't forget what they have learned. Some parents reported that providing minor treatment along with OHE classes would be a great help for them. Some parents reported that providing free tooth paste and tooth brush samples would motivate the children for continuing practicing good oral hygiene habits. Parents wanted to attend a doubt clearing session where they could clear their oral health related doubts.

"if the classes continues then the children won't forget what they have learned ... if possible we would like to have a session to clear our oral health related doubts...if you could .also provide free treatment....not big treatments but at least small treatments along with the classes it would be a great help also children would be more happy to do the brushing if you could give sample paste and tooth brush"

Suggestions put forward by parents for improving the OHE program included continuing conducting OHE classes at regular intervals, providing minor oral treatments along with OHE classes for the children, providing free tooth paste and tooth brush to children to motivate them for tooth brushing and conducting oral health related doubts clearing session for parents.

4.3.3.1.2.6. Parents' opinion regarding the need for such OHE intervention programs in future

Parents reported that there was a need for similar OHE programs. New OHE programs should try to provide minor oral treatments along with classes to the children. Parents liked to be part of such programs.

"new programs should happen…along with classes it would be good if treatment is also given…. we would like to be part of such programs"

Parents' opinions regarding the need for OHE programs in the future indicated that there was a need for similar OHE programs in the future. New programs should provide minor treatments along with OHE classes for children if possible. Parents were ready to part of such OHE programs.

4.3.3.1.3. Main findings from the FGDs with parents and teachers of children in the intervention group

1. The OHE program was useful for the children
2. The OHE program had improved the oral hygiene habits of the children including their
    - Tooth brushing habits
    - Dietary habits
    - Mouth washing habits after food
3. The OHE program had provided children awareness regarding
    - Good dietary habits
    - Washing mouth always after food
    - Dental caries and gum diseases
    - How oral health and general health are related
    - What to do when there is tooth pain or bleeding from gums
    - Detrimental effects of tobacco products
    - Importance of twice daily tooth rushing and morning tooth brushing after breakfast
    - How much tooth paste must be taken and when to change the tooth brush

- Detrimental effects of charcoal, salt, pepper, tooth powder.

4. The OHE program provided training to children regarding
    - Tooth brushing and tongue cleaning technique
5. The charts pasted in the classrooms reminded the children regarding the main points of oral health information.
6. Brushing charts were useful in reminding the children regarding twice daily tooth brushing
7. Encouragement from teachers was a good motivation for the children for twice daily tooth brushing.
8. Class teachers checked the brushing charts monthly. 'Good' comment and 'star mark' on the brushing chart by the class teacher acted as positive reinforcements for twice daily brushing.
9. Pamphlets were useful in providing oral health awareness to teachers and parents
10. Teachers got new oral health information from pamphlets which included
    - the detrimental effects of charcoal
    - morning tooth brushing after breakfast was better for oral health
11. Parents got new information from pamphlets which included
    - the importance of deciduous teeth
    - the shedding time of deciduous teeth and eruption time of permanent teeth
    - morning tooth brushing after breakfast was better for oral health
    - regular dental checkup was important for oral health
    - always visit a dentist when there is tooth pain or bleeding from gums
    - the detrimental effects of materials like charcoal, salt, pepper, tooth powder
12. Suggestions improving the OHE program included

- Continuing conducting OHE classes at regular intervals
- Training teachers to take OHE classes for the children
- Conduct oral health related doubts clearing session for parents and teachers
- Providing minor oral treatments along with OHE classes for the children
- Providing free tooth paste and tooth brush to children to motivate them for tooth brushing

13. There is a need for similar OHE programs in the future. Teachers and parents were willing to be part of future OHE programs. Such OHE programs should
    - involve more children and provide minor treatments along with OHE classes for children if possible

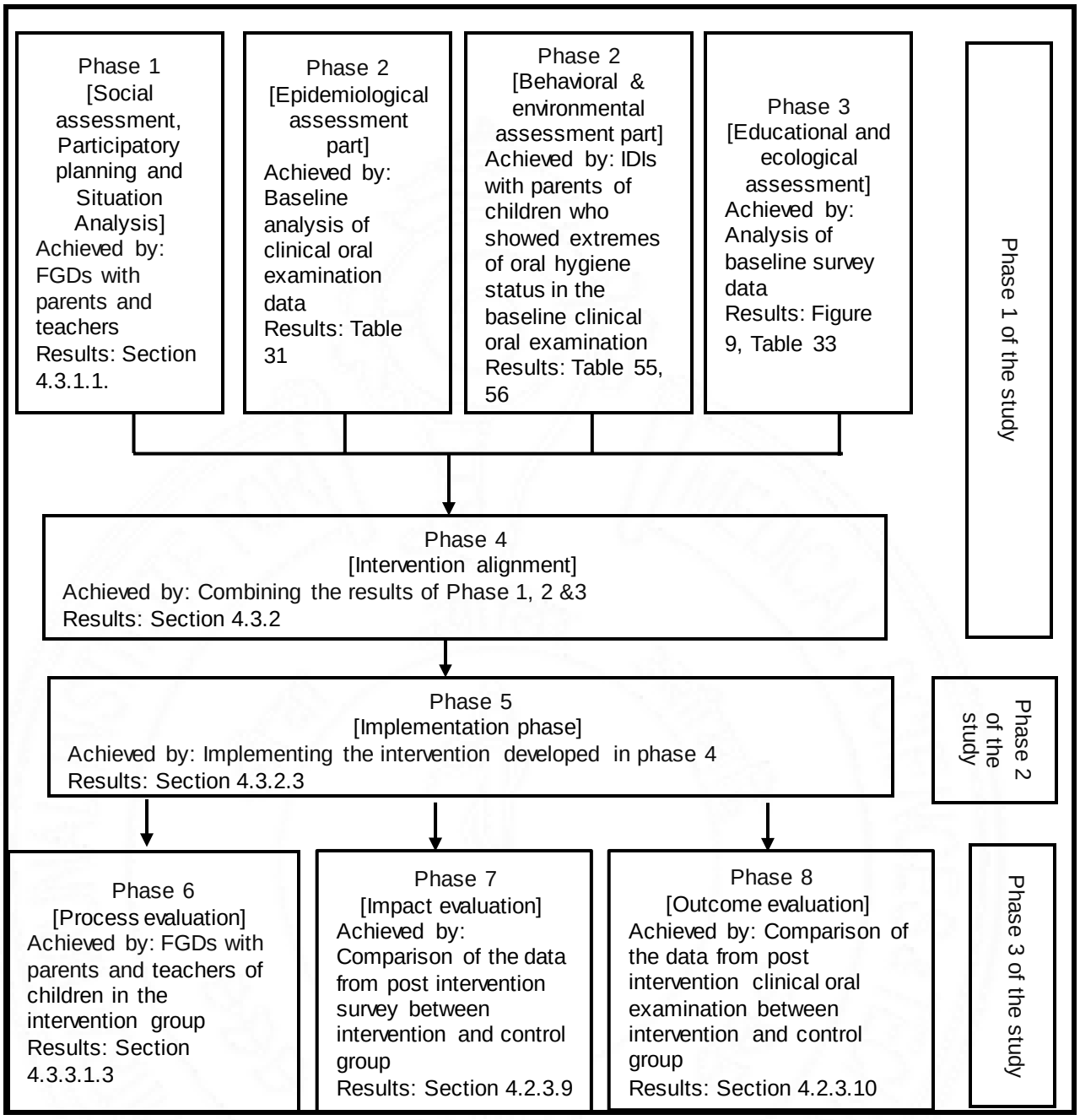


Figure 12: Diagram showing how the entire study was designed and achieved based on the frame work of the PRECEDE–PROCEED model

CHAPTER – 5

DISCUSSION

5.1. Discussion

The major objective of our study was to find out the effect of a school OHE intervention involving three sessions of oral health education classes by the dentist at one month apart on the oral hygiene status among 6-12 year old school children in Thiruvananthapuram educational district.

According to the baseline survey in our study 20% of children had good oral hygiene status, 70.8% of children had fair oral hygiene status and about 9.2% of the children had poor oral hygiene status. In our study majority of the children had fair oral hygiene status. Similar results were shown by earlier studies also. In the study by Thakur et al. among 5 year old children majority of the children (51%) had fair oral hygiene status, rest 41% of the children had good oral hygiene status, and 8% had poor oral hygiene status(Thakur et al. 2017).

Post intervention, in the intervention group the mean OHI-S score decreased from 2.02 ±0.87 at the baseline to 1.65±0.80; while in the control group the mean OHI-S score slightly increased from the baseline value of 2.020±0.87 to 2.18±0.16. There was significant dissimilarity in the differences of OHI-S score between the two groups indicating that the OHE intervention program was effective in improving the oral hygiene status of the children. The importance of this finding was that the improvement occurred even when the children were having a fair oral hygiene status at the baseline. This was possible because the intervention was planned and implemented after carefully understanding the health problems, health behaviors, social and familial situations of the

children. In the interventional study by Sahiti et al also oral health education had a significant impact on the oral hygiene score of 6–7 year old children (Sahiti et al. 2019).

In our study the OHE intervention program was effective in improving the gingival health status of the children because an improvement in oral hygiene status would in turn improve the gingival health status (Theilade et al. 1966). In the intervention group children, there was an increase in the prevalence of normal and mild gingivitis and a decrease in the prevalence of moderate and severe gingivitis which also indicated that the OHE intervention had improved the gingival health status of the children. Among the earlier OHE interventions for 6-12 year old children a few of them (Naidu & Nandlal. 2017) were able to significantly improve the gingival health status of the children while others (Esfahanizadeh. 2011) were not able do so.

The OHE classes in our study were not pre-planned. In our study through baseline survey and FGDs with parents and teachers we gathered information regarding the areas in which the children needed awareness and skill training. We also gathered information regarding the oral health related behavior and attitude of the children and their social and familial situations. Based on that information we developed our OHE classes including the training sessions for children. So, our OHE intervention program was effective in improving the oral health related knowledge, attitude and practices of the children. Among the earlier OHE interventions for children a few of them (Sanadhya et al. 2014) were able to significantly improve the oral health related knowledge, attitude and practices of the children while others (Tolvanen et al. 2009) were able to improve only the oral health related behavior but not knowledge and attitude.

Post intervention, there was increase in the DMFT score and def score of the children in both the groups. The magnitude of increase of both DMFT score and def score was less in the intervention group indicating that the incidence of caries was less in the intervention group. Thus in our study the OHE intervention was effective in proving a better dental health status of the children in the intervention group compared to the children in the control group because good oral health related practices and improved oral hygiene status can reduce the incidence of dental caries (Andlaw. 1978). Fraihat et al. had reported that oral health promotions are cost effective method to reduce the burden of dental caries among children (Fraihat et al. 2019).

In our study the prevalence of dental caries among the children was 67.1% (62.73 - 71.26%). The prevalence of dental caries in deciduous teeth of the children was 52.25% (47.71-56.78%) and the prevalence of dental caries in permanent teeth of the children was 37.2% (32.90 – 41.67%). Similar findings were reported by earlier studies also. Kuriakose et al. reported that the prevalence of dental caries in deciduous dentition of the preschool children of Thiruvananthapuram district was 54% (Kuriakose et al. 2015). David et al. had reported that the prevalence of dental caries in the permanent dentition of 12 year old school children in Thiruvananthapuran district was 27% (David et al. 2005). Reported that the prevalence of dental caries in deciduous and permanent dentition of 6-12 year school children of Mahbubnagar district, Telangana state was 64.2% and 26.6% respectively (Reddy et al. 2017).

In our study the prevalence of mild gingivitis among children was 73.11% (69.09 – 77.15%) and that of moderate gingivitis was 24.9% (21.17 – 29.03%). Severe gingivitis was prevalent in 0.86% (0.23 – 2.18%) of children. Similar findings were given by earlier studies also. In the study by

Sing et al. among 5-14 old school children the overall prevalence of gingivitis was 78.35% (mild gingivitis 54.38%, moderate 21.77%, and severe 2.27%) (Singh et al. 2011).

According to our study the most common source of information of oral health related information for children were their parents. Al-Darwish also reported that the most popular source of oral health information for children were their parents (Al-Darwish. 2016).

In our study the baseline survey showed that about 97.8 % of children cleaned their teeth by themselves and majority (62.6%) of the children used tooth brush and tooth paste to clean their teeth. Similar findings were reported by earlier studies also. In the study by Mehta and Kaur 71.4% of the children used tooth brush and tooth paste to clean their teeth (Mehta & Kaur. 2012).

We used the PRECEDE–PROCEED model as a framework for development, implementation and evaluation of the health behavior theory based school oral health education (OHE) intervention program for 6-12 year old children. The PRECEDE–PROCEED model provides a structure for applying health behavior theories and concepts systematically for planning, implementing and evaluating health behavior change programs. Similar models available include the Ecological model. But we chose the PRECEDE–PROCEED model because it takes into consideration individual and environmental factors affecting one's behavior, also it can be modified according to the context and it provides options for skipping phases when appropriate evidence already exists. The Ecological model focuses more on environmental and policy changes rather than providing individuals with motivation and skills to change behavior (Glanz. 2008).

To the best of our knowledge till date no other study in India has used the PRECEDE–PROCEED model as a framework for development, implementation and evaluation health behavior theory based school oral health education (OHE) intervention program 6-12 year old children. In our study we did not skip any of the phases of the PRECEDE–PROCEED model instead we planned our study in such a way we could accommodated all the phases of the PRECEDE–PROCEED model according to the phases of our study. Figure 11 would help to understand how the entire study was designed and achieved based on the framework of the PRECEDE–PROCEED model.

The PRECEDE–PROCEED model had been used for developing and evaluating many oral health interventions for adults (Binkley & Johnson. 2013), (Colodny et al. 2015) but a very few oral health interventions for children had been developed based on the PRECEDE–PROCEED model (Dimitropoulos et al. 2018). The PRECEDE–PROCEED model was used by Dimitropoulos et al. in 2018 to develop a school-based preventive oral health program to control dental caries in Aboriginal children living in rural and remote communities in New South Wales, Australia; it was a one-year program. Our study was implemented for three months because the major objective our study was due to find the effectiveness of OHE intervention on the oral hygiene status of the 6-12 year old children and three months was enough time to find the effectiveness of oral health intervention programs on oral hygiene status of children (Malik et al. 2017).

The PRECEDE–PROCEED model also helped us to apply the appropriate health behavior theories when needed. In our study the FGDs with parents and teachers of the children in the phase 1 and phase 3 of the study were conducted based on the principle of participation and relevance(Griffiths. 1959). During the phase 1 of our study the participation from parents and teachers and their

opinions helped gave us valuable information regarding the oral hygiene habits of the children and the related situations. The information helped us to plan the intervention program. During the phase 3 of our study the responses from the parents and teachers of the children in the intervention group helped us to understand whether the intervention program was useful for the children, how useful was the OHE materials for the children and for them; and their suggestions to improve the program.

The in depth interviews (IDIs) in the phase 1 of our study with the parents of with parents of children who showed extremes of oral hygiene status in the baseline clinical oral examination were based on the theory of planned behavior (Glanz. 2008). The IDIs helped us to understand the behaviors of the children responsible for their oral health status and the external factors beyond control of the children responsible for their behavior. According to Soltani et al. theory of planned behavior is an important predictor of children's oral health behavior (Soltani et al. 2018). As per theory of planned behavior, intention to perform behavior depends on attitude, subjective norm and perceived control. But children's oral health behavior are also influenced by the oral health behavior of their parents and family members (Poutanen et al. 2006). So, in our study we looked into the descriptive norm along with attitude, subjective norm and perceived control to understand the children's behavior. Earlier studies had also used theory of planned behavior to understand the oral health related behavior of children. Theory of planned behavior had been effectively used to determine the predictors of oral health behavior among preschool children (Soltani et al. 2018).

In our study the development of the school oral health education intervention program was guided by the health belief model. Since the targeted audience for our intervention was 6-12 year old children we used a relatively simple theory like health belief model to guide the development of our intervention. Earlier studies had also developed oral health education programs based on health belief model. In Iran Solhi et al. had successfully used the health belief model to develop oral health education program for 12 year old children (Solhi et al. 2010).

Only decision regarding the intervention which was decided prior to the start of the study was that the intervention group would receive three sessions of oral health education classes by the dentist at one month apart. Even though the dentist-led, teacher-led and peer-led strategies of oral health education are effective in improving the oral health knowledge and oral hygiene status of children, the dentist-led approach is slightly more effective than the other two (Haleem et al., 2012). Since our study was a health behavior theory based approach based on the PRECEDE–PROCEED frame work which was tried for the first time in India for developing the oral health education intervention for 6-12 year old children, we decided that the OHE classes would be conducted by a dentist.

In our study the entire intervention was developed based on the combined information gathered from the FGDs, baseline survey and in depth interviews conducted during the phase 1 of the study. The decisions regarding the interventions were also backed by scientific evidence.

In many of the early studies oral health education classes was conducted with help of oral health education lectures which extended up to 60 minutes (Tai et al. 2001), (Vanobbergen et al. 2004).

The FGDs with teachers had indicated the attention span of children would be 20 to 30 minutes and they would be interested to watch videos. The actual attention span of 6-12 year old children ranged from 12 -36 minutes (Balance. 2020). Educational classes for students would be more effective if they were conducted with help of videos instead of just lectures because video tutorials make the learning process fun, effective, responsive and fruitful (Bregwall. 2015). So, in our study the oral health education classes were conducted with the help of a 20 minutes oral health education video we made. The video had cartoons, pictures and attractive background music.

The oral health education video covered all the topics on which the children needed awareness which were identified from the baseline survey and the FGDs with parents and teachers. Introduction was about the importance of teeth to catch the attention of the teeth. Children knew the role of teeth in chewing and smiling but the role of teeth in speaking was new to them (Johnson & Sandy. 1999).

The FGDs with parents and teachers indicated that issues like irregularly placed permanent teeth due to lack of space, delayed shedding of deciduous teeth were common among the children and some parents were not giving adequate importance to problems of deciduous teeth. Decay of the deciduous teeth can cause damage to the tooth buds of the permanent teeth. If deciduous teeth are lost before time or if they are retained in the mouth beyond their shedding time there won't be adequate space for the permanent teeth to erupt. It can lead to crowding, rotation, midline discrepancies or impaction of the permanent teeth (Ahamed et al. 2012). So, we decided to include the importance of deciduous teeth in the oral health education video.

According to the baseline survey only 70 % of the children had the knowledge regarding the symptoms of dental caries. More than 50 % of the children had no idea regarding the symptoms

of gum diseases or how to prevent gum diseases. In the study by Al-Darwish 55.6% of children had the knowledge regarding the symptoms of dental caries, 63.5% of children had knowledge regarding symptoms of gum diseases and 21% of children had no idea how to how to prevent gum diseases (Al-Darwish. 2016). Dental caries and gingivitis are the most common diseases affecting the children (Nasser et al. 2019). Dental caries if left untreated can lead to pain, abscess formation and tooth loss. Gum diseases cause bleeding from gums and if left untreated for a long time they can lead to tooth loss (FDI. 2015). So, we decided to include the causes, symptoms, sequelae and prevention of dental caries and gum diseases in the oral health education video.

In our study the baseline survey showed that only 39.8% of children knew that oral health and general health were related. In the study by Vishwanathaiah among 10-14 old children almost all children knew that oral health and general health were related (Vishwanathaiah. 2016). Poor oral health is related to digestive problems (Olsen and Yamazaki, 2019), heart diseases (Najafipour et al. 2013) and lung diseases (Gomes-Filho et al. 2010). So, we decided to include how oral health is related to general health in the oral health education video.

Baseline survey showed that about 15.3% of the children daily had sweets and 38.7% of them had soft drinks once in a week. FGDs with parents and teachers also indicated that children liked packed food items and bakery foods items very much. FGDs also indicated that children were not that found of vegetables and they sometimes drank pipe water. Dietary free sugars are the most important risk factor for dental caries. Both the amount of sugars and their frequency of consumption are risk factor for development of dental caries. According to WHO a child's daily intake of free sugars has to be <5% of total energy intake (Moynihan. 2016). The inherent acids and sugars in soft drinks have both acidogenic and cariogenic potential, leading to dental caries and enamel erosion (Cheng et al. 2009) . Fruits, vegetables and good drinking water are essential

for good oral health (UIC. 2017). So, we decided to include dietary habits good for oral health and dietary habits bad for oral health in the oral health education video. The importance of reduced intake of sweets, packed food items, packet juices and soft drinks were also included. We also included how bacteria acted on sugar and produced acids which attacked the tooth enamel leading to dental caries (NIDCR. 2019).

In our study the baseline survey showed that only 55% of the children brushed their teeth at least two times daily. All the children brushed their teeth in the morning majority of them brushed their teeth before breakfast. Similarly in the study by Priya et al. among 10-16 year old children about 60% of the children brushed their teeth at least two times daily and almost all of them brushed their teeth in the morning (Priya et al. 2013). To maintain good oral health twice daily tooth brushing with tooth paste is needed to remove the dental plaque (Holt et al. 2000). Tooth brushing after breakfast helps to remove the food remnants from oral cavity but it should be done about thirty minutes after eating breakfast. Acidic food can weaken the enamel temporarily so tooth brushing should not be done immediately after taking acidic food, so morning tooth brushing should be done about thirty minutes after eating breakfast (Watson. 2020). So, we decided to include importance of twice daily tooth brushing and importance of morning tooth brushing after breakfast in the oral health education video.

In our study the baseline survey showed that about 15% of children used charcoal either regularly or occasionally to clean their teeth. Some children also used materials like tooth power, salt and mango leaf to clean their teeth. FGDs with parents and teachers indicated that some parents and teachers also encouraged children to use charcoal to clean their teeth because of myths associated

with charcoal use like cleaning teeth with finger using charcoal, by applying pressure they could recline forwardly placed teeth and charcoal could whiten the yellow colored teeth. Fact is that materials like charcoal, salt, pepper, tooth powder are abrasive and they wear down tooth enamel and make teeth appear yellow. Everyday use of charcoal could cause tooth sensitivity and could stain older teeth and dental restorations, like veneers, bridges, crowns, and white fillings (Longhurst. 2019). So, we de decided to included detrimental effects of tooth cleaning with materials like charcoal, salt, pepper, tooth powder

In our study the baseline survey showed that about 86 % of children were not following the correct brushing technique. About 91.2% of children cleaned their tongue among them only 3.7% of them used tooth brush to clean their tongue, rest of them used either tongue cleaners (78.5%) or midrib of coconut leaves (17.5%). FGDs with parents and teachers also indicated that children needed training regarding tooth brushing and tongue cleaning technique. Similarly, in the study by Vishwanathaiah 97% of children were not following correct brushing technique. About 99.14% of the children cleaned their tongue and a them 79% of the children used tongue cleaners (Vishwanathaiah. 2016) . Different methods of tooth brushings are there, but in our study, we adopted the Modified Bass brushing technique. The Modified Bass brushing *technique* is the most widely accepted and most effective method of brushing. It is vibratory method of tooth brushing in which the sub gingival plaque is also removed (Poyato-Ferrera et al. 2003). Tongue cleaning with tongue cleaners could damage the taste buds so it would be better to use tooth brush to clean the tongue. Tongue cleaning removes debris and bacteria from the tongue (Vaksman. 2018). So, tooth brushing technique and tongue cleaning technique were included in the oral health education video. In order to teach skills like tooth brushing and tongue cleaning live demonstrations, practice

sessions and individual instructions were more important than audiovisual aids (Leal et al. 2002). So, in our study after the oral health classes children were divided into small groups and were given demonstration of tooth brushing and tongue cleaning technique. After that each child practiced the tooth brushing and tongue cleaning technique with the model and the tooth brush and all their doubts were cleared there itself. Naidu and Nandlal had also used model to demonstrate tooth brushing technique to children in their intervention program (Naidu & Nandlal. 2017).

Baseline survey in our study showed that only 49.3% of children changed their tooth brush in three or less than three months. Rest of the children changed their brush either in six (31.8%) or more than six months (1.9%) or when the bristles of their brush wearied off (17%). FGDs with parents also indicated that many children used the same tooth brush for more than three months or till the bristles of the brush wear doff. FGDs with parents also indicated that many children did not know how much tooth paste to be taken. Similarly, in the study by Vishwanathaiah only 30.86% of children changed their tooth brush in three months. Rest of the children changed their brush either in six months (43.43%), one year (0.57%) or when the bristles of their brush wearied off (22.14%) and about 3% of children were unaware of the time of changing the toothbrush. The study also reported that only 11% of the children applied pea-sized amount of toothpaste on the tooth brush rest of them either applied toothpaste to full length of bristles (53,43%), applied to half-length of the bristles (35.57%) (Vishwanathaiah. 2016). According to the Centers for Disease Prevention and Control (CDC) toothbrush had to be replaced every 3 to 4 months (Watson. 2019). A 'pea sized' amount of tooth paste is recommended for children (ADA. 2014). So, we included topics like when to change tooth brush and how much tooth paste to be taken in the oral health video.

In our study the baseline study showed that about 99.6 % of children always washed their mouth after taking meals. FGDs with parents and teachers indicated that even though the children washed their mouth after meals most of the children did not wash their mouth after eating snacks in between meals. In the study by Vishwanathaiah around 92.29% children did not rinse the mouth after meals (Vishwanathaiah. 2016). Rinsing the mouth with water every time after eating food or drinking water can protect the enamel by removing the leftover food and sugar; when rising with water is not possible drinking good water is also a great way to maintain oral and overall health (Taylor & McLaws. 2017). So, we included the importance of washing mouth every time after meals and snacks in our oral health education video.

According to the baseline survey only 57.4 % of children thought of visiting a dentist if they experienced tooth ache. About 23.4% of children had no idea what to do if they experienced bleeding from their gums. FGDs with the parents also indicated to tackle tooth pain many children and their parents adopted tactics like taking painkillers without consulting dentist, placing Vicks on the tooth, placing clove oil on tooth, placing axe oil on tooth, placing eucalyptus oil on tooth etc. Placing chemicals like eucalyptus oil, Vicks, axe oil, clove oil etc. on the tooth can cause ulcerations, and erosive lesions with burning sensation on the gums and the oral epithelium (Agarwal & Lakshmi.T. 2013). The best thing to do when you experience tooth pain or bleeding from gums is to seek treatment from a dentist (Blahd. 2019). So, we decided to include topics like what to do and what not to do if you experience tooth pain or bleeding from gums in the oral health education video.

In our study the baseline survey showed that about 79% of children knew that tobacco products were harmful to oral health and about 0.2% of children had used tobacco products in the last six months. FGDs with parents indicated that for fun some children imitated how elders used tobacco products. Similarly in the study by Blaggana et al.,71% children knew that smoking was harmful to oral health (Blaggana et al. 2016). In the study by Jaisoorya at al. the life time prevalence of tobacco use among 12 to 13 year old children was 3.1% (Jaisoorya et al. 2016). Tobacco use is associated with harmful effects on health like oral cancer, lung cancer, heart diseases, respiratory diseases and other diseases (Bonnie et al. 2015). So, we included the harmful effects of tobacco products in the oral health education video.

According to the baseline survey about 44.3% of children had never visited a dentist. Among those children who had visited dentist only 22% of them had visited dentist in last six months and only 1.5% of them had their last dental visit for regular dental checkup. FGDs with parents and teachers also indicated that parents most parents did not took their children for regular dental checkups. Gualie and Tayachew reported that in their study 58.8% of the children had never visited a dentist and among those children who had visited the dentist only 1.15% of them went for regular dental checkup (Gualie & Tayachew. 2018). Olatosi et al. reported that most of the parents thought that there was no need to take the children to the dentist unless there was a problem so they did not take their children for regular dental checkup (Olatosi. 2019). A regular dental checkup every six months is important because they help keep the teeth and gums healthy. Regular dental checkups increase the probability of diagnosing and managing oral diseases in their early stages thus limiting any significant or irreversible damage to teeth and gums (John et al. 2017). So, we included the importance of regular dental checkups every six months in the oral health education video.

The oral health education materials we developed for our study included charts, pamphlets, and brushing charts.

The charts were pasted in the class rooms. A total of four charts were developed. First two charts included the main points of all the topics which were covered in the OHE class. The third chart illustrated the brushing technique. The fourth chart dealt with the shedding time of deciduous teeth and eruption time of permanent teeth. Post intervention FGDs with teachers of the children in the intervention group indicated that the charts were useful in reminding children regarding the important points of the oral health education class including brushing technique. Tolvanen et al. had also used posters as a means to provide oral health education to children in their oral health intervention (Tolvanen et al. 2009).

One pamphlet was developed, with information printed on both sides of it. Copies of the pamphlet were taken and distributed among the children. Children took the copies of the pamphlets to their parents and family members. Pamphlets were also distributed to the teachers and staff in the school. FGDs with parents and teachers during the phase 1 of the study had indicated that it was not feasible to conduct separate OHE classes for the parents and the teachers. So, through the pamphlets we were able to inform the parents and teachers regarding the main points of all the topics which were covered in the oral health education classes, the correct method of tooth brushing, the shedding time of deciduous teeth and eruption time of permanent teeth. Post intervention FGDs with parents and teachers of the children in the intervention group indicated that the pamphlets were useful in providing oral health awareness to parents and teachers. Sadana

et al. had used self-educational take –home pamphlets were used to provide oral health education to 10-12 year old children in their oral health education intervention (Sadana et al. 2017).

According to the baseline survey among those children who brushed their teeth only once daily, 66% of them failed to brush their teeth twice daily because of forgetfulness. FGDs with parents and teachers during the phase 1 of the study also indicated that most of the children did not brush their teeth at night because of forgetfulness and they needed reminders for twice daily brushing. Al-Darwish also reported that many children did not brush their teeth at night because of forgetfulness (Al-Darwish. 2016). Tooth brushing charts have been found to be helpful for children who forget to brush their teeth twice daily (Watson. 2020). So monthly brushing charts were developed and distributed among the children after every OHE class. Each child received of total of three brushing charts over a period of three months. It had had boxes for the children to put tick mark after they did tooth brushing during morning and at night. Post intervention FGDs with parents and teachers of the children in the intervention group indicated that the brushing, charts were useful in reminding the children regarding twice daily tooth brushing.

In many of the earlier oral health education interventions for children, the teachers played an important role. In many of those studies the oral health education classes were taken by the teachers (Naidu & Nandlal. 2017), (Tai et al. 2001). In our study the role of the teachers was not predetermined, it was determined based on the information gathered during the phase 1 of the study. According to the baseline survey among those children who brushed their teeth only once daily, 19% of them failed to brush their teeth twice daily because of laziness. FGDs with parents and teachers also indicated that some of the children did not brush their teeth at night because of laziness; and encouragement from the teachers would motivate those children for twice daily

brushing. So, we sought the participation of the class teachers and they were happy to be a part of the intervention program. During the regular school days, the class teachers reminded and encouraged the children to brush twice daily. At the end of every month after the OHE class, the class teachers checked the brushing charts of the children and gave their comments according to the instructions given to them. Post intervention FGDs with parents and teachers of the children in the intervention group indicated that encouragement from teachers was a good motivation for the children for twice daily tooth brushing. 'Good' comment and 'star mark' on the brushing chart by the class teacher acted as positive reinforcements for twice daily brushing.

During the phase 1 of our study the in depth interviews with parents of the children who showed extremes of oral hygiene status in the base line survey helped us to identify the external factors which affected the children's oral health. The external factors we identified were lack of available and affordable nearby dental care services, delay in getting appointment in government dental facilities, costly private dental facilities, long waiting time in government dental hospitals and lack time from parents' part. Earlier studies also had made similar findings. Bhatia et al. identified that long waiting at the dental clinics and parents commitment towards others work had affected children's dental visits (Bhatia et al. 2018). Verma et al. reported that in government dental clinics the waiting times were longer, the appointments took longer time, there was unavailability of medicines and even lack of emergency dental services. In spite of all these patient still opted for government dental clinics because they were cheaper than private dental care centers (Verma et al. 2012). The external factors identified in our study were not addressed in our intervention program because it was beyond the scope of our study.

In our study among those children who had never visited the dentist, about 30.9% of those children (13.8% of the total children) reported that it was because of fear that they never visited a dentist and the rest 4.4% reported that they never visited a dentist because their parents never took them to a dentist. Among those children who reported that they never visit a dentist because of fear, 60.32% of them reported that they feared tooth extraction while the rest of the 30.7% reported that they had the fear of injection. Earlier studies also had similar findings. AlSarheed reported that in his study 12% of the children did not go for dental treatments because of fear. He also reported that fear of injection and tooth extraction were the most common fears that prevented children from going to dentist (AlSarheed. 2011). Bhagat et al. reported that many children missed their dental checkups due to parental failure. The barriers which prevented parents from taking children taking to the dentist were lack of knowledge regarding importance of oral health, treatment cost and time, missing school, daily work load, fear of treatment, and multiple visits (Bhagat et al. 2014). FGDs with parents of the children in the intervention group indicated that through pamphlets we were able to provide oral health awareness to the parents including the need of regular dental visits for children.

The baseline survey in our study showed that among those children who had visited dentist, the most common reasons for their last dental visit were tooth pain and dental caries. Many of the earlier studies had also reported that the most common reasons for dental visit among children were tooth pain and dental caries (Olatosi et al. 2019), (Subramaniam & Reghuvaran. 2019). In our study about 98.9% of children had some form of gingivitis. But among those children who had never visited the dentist, about 64.7% (that means 28.6% of total children) of them did so because they believed that they had no dental problems. So, it was the lack of awareness about their oral

health problems that prevented them from seeking dental care. Sanguida et al also reported that the most common reason for children not visiting a dentist was parent's belief that their children had no dental problems (Sanguida et al. 2019). So, there is a need for oral health education intervention programs like ours which could make the children aware of their oral health problems so that they would seek care for their problems.

The baseline survey showed that the absenteeism from school in the last three months due to oral health problems was about 13.3%. The FGDs with parents and teachers also showed that many children missed their classes due to oral health problems. Neves et al. reported that the prevalence of absenteeism among preschool children due to oral problems was 8.4 % (Neves et al. 2016). Ruff et al, in the systematic review and meta-analysis on oral health, academic performance, and school absenteeism in children reported that poor oral health is significantly associated with increased chance of absenteeism and poor academic performance (Ruff et al. 2019). So, there is a need for more preventive oral health education intervention programs like ours which could improve the oral health status of the children.

5.2. Strengths of the study

1. This study was planned, developed and implemented based on the PRECEDE–PROCEED model. All the phases of the PRECEDE–PROCEED model were included in this study.
2. This study followed a health behavior theory based approach. Appropriate theories were selected and applied in all stages whenever they were needed.
3. In this study the OHE intervention was not pre-planned. It was developed according to the needs of the children. Only decision regarding the intervention which was decided prior to the start of the study was that the intervention group would receive three sessions of oral

health education classes by the dentist at one month apart. All the other decisions were made based on the information gathered during the phase 1 of the study.

5.3. Limitations of the study

1. To find out the long-term effect of the study, long term follow up would be needed.
2. The external factors like lack of available and affordable nearby dental care services, delay in getting appointment in government dental facilities, costly private dental facilities, long waiting time in government dental hospitals and lack of time from parents' part which affected the oral health behavior of the children could not be addressed in the intervention.

5.4. Future implications

1. Similar studies with long term follow up periods should be done to find out the effect of long-term effect of the OHE intervention.
2. In future studies the OHE intervention should try to address the external factors that could affect the oral health behavior of the children.
3. If possible, in future studies the OHE intervention program should include OHE classes for parents and teachers along with OHE classes for children.
4. Future studies should try to find out the effect of similar OHE intervention in which the OHE classes would be taken by trained teachers.

5.5. Policy Recommendations

1. Oral health education classes should be part of school syllabus
2. Involvement of parents and teachers in OHE classes

3. Periodic oral health check-up of children by oral health nurses/ dentists should be arranged in the schools.
4. Weekly tooth brushing drills can be arranged after school assembly.
5. Tooth brushing kits can be provided to chidren via schools.
6. Implementing anti-tobacco rules in schools in a stricter way.

CHAPTER 6

SUMMARY AND CONCLUSION

6.1. Summary

In our study we wanted to find the effect of a school OHE intervention involving three sessions of oral health education classes by the dentist at one month apart on the oral hygiene status among 6-12 year old school children. We adopted a health behavior theory based approach based on PRECEDE-PROCEDE model framework for development, implementation and evaluation of our OHE intervention.

The major finding of the study was that the OHE intervention program was effective in improving the oral hygiene status of the 6-12 year old children. The importance of this finding was that the improvement occurred even when the children were having a fair oral hygiene status at the baseline. This was possible because the intervention was planned and implemented after carefully understanding the health problems, health behaviors, social and familial situations of the children.

Other important findings of the study were

- The OHE intervention program was effective in improving the gingival health status of the 6-12 year old children.
- In the intervention group the OHE intervention resulted an increase in the prevalence of normal and mild gingivitis and a decrease in the prevalence of moderate and severe gingivitis indicating an improvement in the gingival health status of the children in the intervention group.

- The OHE intervention program was effective in improving the oral health related knowledge, attitude and practices of the 6-12 year old children.
- OHE intervention was effective in proving a better dental health status to children in the intervention group compared to the children in the control group
- The prevalence of dental caries among 6-12 year old children was 67.1% (62.73 - 71.26%). The prevalence of dental caries in deciduous dentition of 6-12 year old children was 52.25% (47.71-56.78%) and the prevalence of dental caries in permanent dentition of 6-12 year old children was 37.2% (32.90 – 41.67%). About 22.4% of children had dental caries in both deciduous and permanent dentition.
- About 98.9% of children had some form of gingivitis. The prevalence of mild gingivitis was 73.11% (69.09 – 77.15%) and that of moderate gingivitis was 24.9% (21.17 – 29.03%). Severe gingivitis was prevalent in 0.86% (0.23 – 2.18%) of children.
- At baseline only 20% of children had good oral hygiene status. About 70.8% of children had fair oral hygiene status and about 9.2% of the children had poor oral hygiene status.

6.2. Conclusion

To conclude, our study used the PRECEDE–PROCEED model as a framework for development, implementation and evaluation of health behavior theory based school oral health education (OHE) intervention program in 6-12 year old children. The results showed that our school OHE intervention involving three sessions of oral health education classes by the dentist at one month apart was effective in improving the oral hygiene status among 6-12 year old children, the prevalence of dental caries among 6-12 year old children was 67.1% (62.73 - 71.26%), overall

prevalence of gingivitis among 6-12 year children was 98.9%, in the intervention group the OHE intervention resulted an increase in the prevalence of normal and mild gingivitis and a decrease in the prevalence of moderate and severe gingivitis indicating an improvement in the gingival health status of the children in the intervention group and the OHE intervention program was effective inimproving the oral health related knowledge, attitude and practices of the 6-12 year old children. In future similar studies with long term follow up may be done to find out the long-term effect of the OHE intervention.

BIBILIOGRAPHY

ADA (2014) Fluoride toothpaste use for young children. *J Am Dent Assoc* 145(2): 190–191.

Adair PM, Burnside G, Pine CM (2013) Adair PM, Burnside G, Pine CM. Analysis of health behaviour change interventions for preventing dental caries delivered in primary schools. *Caries Res* 47 Suppl 1:2-12.

Agarwal R and Lakshmi.T (2013) Eucalyptus oil in dentistry: A mini Review. [Online]. *Int. J Drug Dev Res*. Available: https://www.ijddr.in/abstract/eucalyptus-oil-in-dentistry-a-mini-review-5744.html [Accessed 24 July 2020].

Ahamed SS, Reddy VN, Krishnakumar R, Mohan MG, Sugumaran DK, Rao AP. Prevalence of early loss of primary teeth in 5-10-year-old school children in Chidambaram town. *Contemp Clin Dent* 3(1):27-30.

Al-Darwish MS (2016) Oral health knowledge, behaviour and practices among school children in Qatar. *Dent Res J (Isfahan)* 13(4):342-353.

Alsarheed M (2011) Children's Perception of Their Dentists. *Eur J Dent* 5(2):186-190.

Alsumait A, ElSalhy M, Raine K, Cor K, Gokiert K, Al-Mutawa S, Amin M (2015) Impact of dental health on children's oral health-related quality of life: a cross-sectional study. *Health Qual Life Outcomes* 13:98.

Andlaw RJ (1978) Oral hygiene and dental caries--a review. *Intl Dent J* 28(1): 1–6.

Baehni PC (2012) Translating science into action--prevention of periodontal disease at patient level. *Periodontol 2000* 60(1): 162–172.

Balaji SM (2018) Burden of dental diseases in India as compared to South Asia: An insight. *Indian J Dent Res* 29(3): 374.

Balance (2020) Normal Attention Span Expectations By Age. [Online]. Brain Balance. Available: https://blog.brainbalancecenters.com/normal-attention-span-expectations-by-age [Accessed 20 July 2020].

Bennadi D and Reddy CVK (2013) Oral health related quality of life. *J Int Soc Prev Community Dent* 3(1): 1–6.

Bhagat D, Khan MHA, Uddin MA (2014) Barriers for Parental Failure in Bringing their Childre n to the Dental Clinic—A Questionnaire-based Study in Indian Population. *Indian J Mednodent and Allied Sciences* 2(1): 17.

Bhatia R, C Vora E, Panda A (2018) Pediatric Dental Appointments No-show: Rates and Reasons. *Int J Clin Pediatr Dent* 11(3):171-176.

Bian H and Smith CL (2006) Development of a questionnaire to assess dentists' knowledge, opinion, education resources, physician cooperation, and clinical practice regarding obstructive sleep apnea (OSAQ-D). *Sleep Breath* 10(2):76-82.

Binkley CJ and Johnson KW (2013) Application of the PRECEDE-PROCEED Planning Model in Designing an Oral Health Strategy. *J Theory Pract Dent Public Health* 1(3).

Blaggana A, Grover V, Anjali, Kapoor A, Blaggana V, Tanwar R, Kaur H, Haneet RK (2016) Oral Health Knowledge, Attitudes and Practice Behaviour among Secondary School Children in Chandigarh. *J Clin Diagn Res* 10(10):ZC01-ZC06.

Blahd WH (2019) Toothache and Gum Problems [Online]. University of Michigan Medicine. Available: https://www.uofmhealth.org/health-library/tooth [Accessed 24 July 2020].

Bonnie RJ, Stratton K, Kwan LY (2015) The Effects of Tobacco Use on Health. Public Health Implications of Raising the Minimum Age of Legal Access to Tobacco Products. [Online] National Academies Press (US). Available: https://www.ncbi.nlm.nih.gov/books/NBK310413/ [Accessed 25 July 2020].

Bregwall T (2015) 7 Reasons Students Learn Better With Video. [Online]. Linked in. Available: https://www.linkedin.com/pulse/7-reasons-students-learn-better-video-travis-bergwall [Accessed 20 July 2020].

Cannick GF, Horowitz AM, Garr DR, Reed SG, Neville BW, Day TA, Woolson RF, Lackland DT (2007) Oral cancer prevention and early detection: using the PRECEDE-PROCEED framework to guide the training of health professional students. *J Cancer Educ* 22(4): 250–253.

Chandrashekar BR, Suma S, Sukhabogi JR, Manjunath BC, Kallury A (2014) Oral health promotion among rural school children through teachers: an interventional study. *Indian J Public Health* 58(4):235-240.

Cheng R, Yang H, Shao MY, Hu T, Zhou XD (2009) Dental erosion and severe tooth decay related to soft drinks: a case report and literature review. *J Zhejiang Univ Sci B* 10(5):395-399.

Colodny N, Miller L, Faralli M (2015)The development of a feeding, swallowing and oral care program using the PRECEDE-PROCEED model in an orphanage-hospital in Guatemala. *Int J Speech Lang Pathol* 17(2):127-137.

Christian B, Ummer-Christian R, Blinkhorn A, Hegde V, Nandakumar K, Marino R, Chattopadhyay A. An epidemiological study of dental caries and associated factors among children residing in orphanages in Kerala, India: Health in Orphanages Project (HOPe). Int Dent J. 2019 Apr;69(2):113-118. doi: 10.1111/idj.12419. Epub 2018 Aug 13. PMID: 30101521.

David J, Wang NJ, Åstrøm AN, Kuriakose S. (2005) Dental caries and associated factors in 12-year-old schoolchildren in Thiruvananthapuram, Kerala, India. *Int J of Paediatr Dent* 15(6): 420–428.

Dental Health Services Victoria (2011) Links between oral health and general health, the case for action [Online]. Available: https://www.dhsv.org.au/___

data/assets/pdf_file/0013/2515/links-between-oral-health-and-general-health-the-case-for-action.pdf [Accessed 4 October 2019].

Dharamsi S, Jivani K, Dean C, Wyatt C (2009) Oral care for frail elders: knowledge, attitudes, and practices of long-term care staff. *J Dent Educ* 73(5):581-588.

Dimitropoulos Y, Holden A, Gwynne K, Irving M, Binge N, Blinkhorn A (2018) An assessment of strategies to control dental caries in Aboriginal children living in rural and remote communities in New South Wales, Australia. *BMC Oral Health* 18(1):177.

Dwarakanath CD, Uppoor A, Carranza FA, Ambalavanan N, Jain A, Nayak DG (2016) *Newman and Carranza's Clinical Periodontology: Third South Asia Edition*. Elsevier India, Navi Mumbai.

Erikson (2019) Erikson's 8 Stages of Psychosocial Development [Online]. Lumen Education, Society, & the K-12 Learner. Available: https://courses.lumenlearning.com/teachereducationx92x1/chapter/eriksons-stages-of-psychosocial-development/ [Accessed 30 March 2020].

Esfahanizadeh N (2011) Dental health education programme for 6-year-olds: a cluster randomised controlled trial. *Eur J Paediatr Dent* 12(3):167-170.

FDI (2015) Oral Health Atlas The challenge of oral diseases - A call for global action, The oral health atlas - second edition (2015). [Online]. *FDI World Dental Federation* Available: https://www.fdiworlddental.org/resources/publications/oral-health-atlas/oral-health-atlas-2015 [Accessed 13 March 2020],

Fraihat N, Madae'en S, Bencze Z, Herczeg A, Varga O (2019) Clinical Effectiveness and Cost-Effectiveness of Oral-Health Promotion in Dental Caries Prevention among Children: Systematic Review and Meta-Analysis. *Int J Environ Res Public Health* 16(15):2668.

Gaddey HL (2017) Oral manifestations of systemic disease. *Gen Dent* 65(6): 23–29.

Gambhir RS, Sohi RK, Nanda T, Sawhney GS, Setia S (2013) Impact of school based oral health education programmes in India: a systematic review. J Clin Diagn Res (12): 3107–3110.

GBD 2017 Disease and Injury Incidence and Prevalence Collaborators (2018) Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 392(10159):1789-1858.

General Education Department (2019) Office of the District Educational Officer [Online]. Depart ment of general education. Available: https://education.kerala.gov.in/deo-offices-2/ [Accessed 12 April 2020].

Ghaffari M, Rakhshanderou S, Ramezankhani A, Noroozi M, Armoon B (2018) Oral Health Education and Promotion Programmes: Meta-Analysis of 17-Year Intervention. *Int J Dent Hyg* 16(1):59–67.

Glanz K, Barbara KR, Viswanath K (2008) Health Behavior and Health Education: Theory, Research, and Practice. [Online] Jossey-Bass. Available: https://epdf.pub/health-behavior-and-health-education-theory-research-and-practice.html [Accessed 6 April 2020].

Gomes-Filho IS, Passos JS, Seixas da Cruz S (2010) Respiratory disease and the role of oral bacteria. *J Oral Microbiol* 2:10.3402/jom.v2i0.5811.

Griffiths W (1959) The Principle of Participation: Some Points to Consider. *Health Edu J* 17(4): 222–229.

Gualie YTand Tayachew AT (2018) Assessment of knowledge, attitude, and practice toward oral hygiene among governmental secondary school students in Debre Tabor Town, Amhara Region, North Central Ethiopia 2018: Institutional-based cross-sectional survey. *Int J Oral Health Sci* 8(2): 92-98.

Habbu SG, Krishnappa P (2015) Effectiveness of oral health education in children - a systematic review of current evidence (2005-2011). *Int Dent J* 65(2):57-64.

Haleem A, Siddiqui MI, Khan AA (2012) School-based strategies for oral health education of adolescents- a cluster randomized controlled trial. *BMC Oral Health* 12(1): 54.

Hegde R and Awan KH (2019) Effects of periodontal disease on systemic health. *Dis Mon* 65(6):185-192.

Holt R, Roberts G, Scully C. Dental damage, sequelae, and prevention. *West J Med* 174(4):288-290

Jackson SL, Vann WF Jr, Kotch JB, Pahel BT, Lee JY (2011) Impact of poor oral health on children's school attendance and performance. *Am J Public Health* 101(10):1900-1906.

Jaisoorya TS, Beena KV, Beena M, Jose DC, Ellangovan K, Thennarasu K, Benegal V (2016) Prevalence & correlates of tobacco use among adolescents in Kerala. *India. Indian J Med Res* 144(5):704-711.

John JR, Mannan H, Nargundkar S, D'Souza M, Do LG, Arora A (2017) Predictors of dental visits among primary school children in the rural Australian community of Lithgow. *BMC Health Serv Res* 17(1):264.

Johnson NC, Sandy JR (1999) Tooth position and speech--is there a relationship? *Angle Orthod* 69(4):306-310.

Jürgensen N, Petersen PE, Ogawa H, Matsumoto S (2012) Translating science into action: periodontal health through public health approaches. *Periodontol 2000* 60(1):173-187.

Kay E, Vascott D, Hocking A, Nield H, Dorr C, Barrett H (2016) A review of approaches for dental practice teams for promoting oral health. *Community Dent Oral Epidemiol* 44(4):313-330.

Kelekar U and Naavaal S (2018) Hours Lost to Planned and Unplanned Dental Visits Among US Adults. *Prev Chronic Dis* 15:11.

Kuriakose S, Prasannan M, Remya KC, Kurian J, Sreejith KR (2015) Prevalence of early childhood caries among preschool children in Trivandrum and its association with various risk factors. Contemp Clin Dent 6(1):69-73.

Leal SC, Bezerra AC, de Toledo OA (2002) Effectiveness of teaching methods for tooth brushing in preschool children. *Braz Dent J* 13(2):133-136.

Longhurst AS (2019) Charcoal Toothpaste for Teeth Whitening: Does It Work and Is It Safe? [Online]. Healthline. Available: https://www.healthline.com/health/dental-and-oral-health/charcoal-toothpaste [Accessed 23 July 2020].

Malik A, Sabharwal S, Kumar A, Singh Samant P, Singh A, Kumar Pandey V (2017) Implementation of Game-based Oral Health Education *vs* Conventional Oral Health Education on Children's Oral Health-related Knowledge and Oral Hygiene Status. *Int J Clin Pediatr Dent* 10(3):257-260.

Mehta A, Kaur G (2012) Oral health-related knowledge, attitude, and practices among 12-year-old schoolchildren studying in rural areas of Panchkula, India. *Indian J Dent Res* 23(2): 293.

Menegaz AM, Silva AER, Cascaes AM (2018) Educational interventions in health services and oral health: systematic review. *Rev Saúde Pública* 52:52.

Moynihan P (2016) Sugars and Dental Caries: Evidence for Setting a Recommended Threshold for Intake. *Adv Nutr* 7(1): 149–156.

Naidu J and Nandlal B (2017) Evaluation of the Effectiveness of a Primary Preventive Dental Health Education Programme Implemented Through School Teachers for Primary School Children in Mysore City. *J Int Soc Prev Community Dent* 7(2): 82–89.

Naito M, Yuasa H, Nomura Y, Nakayama T, Hamajima N, Hanada N (2006) Oral health status and health-related quality of life: a systematic review. *J Oral Sci* 48(1): 1–7.

Najafipour H, Mohammadi TM, Rahim F, Haghdoost AA, Shadkam M, Afshari M (2013) Association of oral health and cardiovascular disease risk factors "results from a community based study on 5900 adult subjects". [Online]. ISRN Cardiol. 2013 Jul 9. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3727197/ [Accessed 23 July 2020]

Nakre PD and Harikiran AG (2013) Effectiveness of oral health education programs: A systematic review. *J Int Soc Prev Community Dent* 3(2): 103–115.

Nalli S, Bindiganavale S, Chowdary B (2016) A study of oral health promotion activities in India. *Intl J Community Med Public Health*: 2270–2274.

Nasser GA, Rupkumar, Junaid M (2019) Prevalence of dental caries and gingivitis among corporation school-going children in Chennai city – A population-based cross-sectional study. *SRM J Res Dent Sci* 10(1): 7-11.

Neves ÉTB, Firmino RT, de França Perazzo M, Gomes MC, Martins CC, Paiva SM, Granville-Gracia AF (2016) Absenteeism among preschool children due to oral problems. *J Public Health* 24(1): 65–72.

NIDCR (2019) Tooth Decay (Dental Caries) Causes, Symptoms, Diagnosis, Treatment [Online]. National Institute of Dental and Craniofacial Research. Available: https://www.nidcr.nih.gov/health-info/tooth-decay/more-info [Accessed 22 July 2020].

Nomura Y, Matsuyama T, Fukai K, Okada A, Ida M, Hamamura H, et al. (2019) PRECEDE-PROCEED model based questionnaire and saliva tests for oral health checkup in adult. *J Oral Sci* 61(4): 544–548.

Noordzij M, Tripepi G, Dekker FW, Zoccali C, Tanck MW, Jager KJ (2010) Sample size calculations: basic principles and common pitfalls. *Nephrol Dial Transpl* 25(5): 1388–1393.

Olatosi OO, Onyejaka NK, Oyapero A, Ashaolu JF, Abe A (2019) Age and reasons for first dental visit among children in Lagos, Nigeria. *Niger Postgrad Med J*26(3):158-163.

Olsen I, Yamazaki K (2019) Can oral bacteria affect the microbiome of the gut? *J Oral Microbiol* 11(1):1586422.

Parihar AS, Katoch V, Rajguru SA, Rajpoot N, Singh P, Wakhle S (2015) Periodontal Disease: A Possible Risk-Factor for Adverse Pregnancy Outcome. J *Int Oral Health* 7(7):137-42.

Peres MA, Macpherson LMD, Weyant RJ, Daly B, Venturelli R, Mathur MR, et al. (2019) Oral diseases: a global public health challenge. *Lancet* 394(10194): 249–260.

Peter S (2003) *Essentials of Preventive and Community Dentistry*. Arya (Medi) Publishing House, New Delhi.

Poutanen R, Lahti S, Tolvanen M, Hausen H (2006) Parental influence on children's oral health-related behavior. *Acta Odontolo Scand* 64(5): 286–292.

Poyato-Ferrera M, Segura-Egea JJ, Bullón-Fernández P (2003) Comparison of modified Bass technique with normal toothbrushing practices for efficacy in supragingival plaque removal. *Int J Dent Hyg* 1(2): 110–114.

Prabhu DS and John J (2015) Oral Health Education for Improving Oral Health Status of School Children - A Systematic Review. *J Dent Med Sci 14(2): 101-106.*

Preshaw PM, Alba AL, Herrera D, Jepsen S, Konstantinidis A, Makrilakis K, Taylor R (2012) Periodontitis and diabetes: a two-way relationship. Diabetologia 55(1):21-31.

Priya M, Devdas K, Amarlal D, Venketachalapathy A (2013) Oral health attitudes, knowledge and practice among school children in Chennai, India. *J Educ Ethics Dent* 3(1): 26.

Priya PRG, Asokan S, Janani RG, Kandaswamy D (2019) Effectiveness of school dental health education on the oral health status and knowledge of children: A systematic review. *Indian J Dent Res* 30(3):437-449.

Reddy KS, Reddy S, Ravindhar P, Balaji K, Reddy H, Reddy A (2017) Prevalence of dental caries among 6–12 years school children of Mahbubnagar District, Telangana State, India: A cross-sectional study. *Indian J Dent Sci* 9:1-7.

Ruff RR, Senthi S, Susser SR, Tsutsui A (2019) Oral health, academic performance, and school absenteeism in children and adolescents: A systematic review and meta-analysis. *J Am Dent Assoc* 150(2):111-121.e4.

Sadana G, Gupta T, Aggarwal N, Rai HK, Bhargava A, Walia S (2017) Evaluation of the Impact of Oral Health Education on Oral Hygiene Knowledge and Plaque Control of School-going Children in the City of Amritsar. *J Int Soc Prev Community Dent* 7(5):259-263.

Sahiti PS, Kamatham R, Saikiran KV (2019) Impact of tooth brushing rhyme on the oral hygiene status of 6-7 year old children - an educational intervention study. *Med Pharm Rep* 92(4):413-417

Sanadhya YK, Thakkar JP, Divakar DD, Pareek S, Rathore K, Yousuf A, Ganta S, Sobti G, Maniar R, Asawa K, Tak M, Kamate S (2014) Effectiveness of oral health education on knowledge, attitude, practices and oral hygiene status among 12-15-year-old schoolchildren of fishermen of Kutch district, Gujarat, India. *Int Marit Health* 65(3):99-105

Sanaei Nasab H, Yazdanian M, Mokhayeri Y, Latifi M, Niksadat N, Harooni J, Armoon B (2019) The role of psychological theories in oral health interventions: A systematic review and meta-analysis. *Int J Dent Hyg* 17(2): 142–152.

Sanguida A, Vinothini V, Prathima GS, Santhadevy A, Premlal K, Kavitha M (2019) Age and Reasons for First Dental Visit and Knowledge and Attitude of Parents Toward Dental Procedures for Puducherry Children Aged 0-9 years. *J Pharm Bioallied Sci* 11(Suppl 2):S413-S419.

Sato K and Oda M (2011) Analysis of the factors that affect dental health behavior and attendance at scheduled dental check-ups using the PRECEDE-PROCEED Model. *Acta Medica Okayama* 65(2): 71–80.

Sharva V, Reddy V, Bhambal A, Agrawal R (2014) Prevalence of Gingivitis among Children of Urban and Rural Areas of Bhopal District, India. *J Clin Diagn Res*. 2014;8(11):ZC52-ZC54.

Singh M, Saini A, Saimbi CS, Bajpai AK (2011) Prevalence of dental diseases in 5- to 14-year-old school children in rural areas of the Barabanki district, Uttar Pradesh, India. *Indian J Dent Res* 22(3):396-399.

Soldani F and Wu J (2018) School based oral health education. *Evid Based Dent* 19(2): 36–37.

Solhi M, Zadeh DS, Seraj B, Zadeh SF (2010) The Application of the Health Belief Model in Oral Health Education. *Iran J Public Health* 39(4): 114–119.

Soltani R, Sharifirad G, Mahaki B, Eslami AA (2018) Determinants of Oral Health Behavior among Preschool Children: Application of the Theory of Planned Behavior. *J Dent (Shiraz)*19(4): 273–279.

Stein C, Santos NML, Hilgert JB, Hugo FN (2018) Effectiveness of oral health education on oral hygiene and dental caries in schoolchildren: Systematic review and meta-analysis. *Community Dent Oral Epidemiol* 46(1):30-37.

Subramaniam P, Reghuvaran J (2019) Age and reasons for first dental visit: A cross-sectional study of children in Bengaluru, India. *J Indian Assoc Public Health Dent* 17:293-300

Sukhabogi JR, Shekar C, Hameed Ia, Ramana I, Sandhu G (2014) Oral Health Status among 12- and 15-Year-Old Children from Government and Private Schools in Hyderabad, Andhra Pradesh, India. *Ann Med Health Sci Res* 4(Suppl 3):S272-S277.

Suznemeth (2016) Piaget's Theory of Cognitive Development [Online]. Glogster EDU - Interactive multimedia posters. Available: https://edu.glogster.com/glog/piagets-theory-of-cognitive-development/25ve0u2i09a [Accessed 30 March 2020].

Tai B, Du M, Peng B, Fan M, Bian Z (2001) Experiences from a school-based oral health promotion programme in Wuhan City, PR China. *Int J Paediatr Dent* 11(4):286-291.

Taylor Tand McLaws N (2017) Stop Brushing After You Eat - Do this instead. [Online] Arizona Associates in Dentistry. Available: https://www.drtimtaylor.com/blog/stop-brushing-eat-instead/ [Accessed 24 July 2020].

Thakur AS, Acharya S, Singhal D, Rewal N, Bhardwaj VK (2017) Oral health status and oral health behaviors of 12-year-old urban and rural school children in Udupi, Karnataka, India: A cross-sectional study. *J Dent Allied Sci* 6:12-6.

Theilade E, Wright WH, Jensen SB, Loe H (1966) Experimental gingivitis in man. *J Periodontal Res* 1(1): 1–13.

Tolvanen M, Lahti S, Poutanen R, Seppä L, Pohjola V, Hausen H (2009) Changes in children's oral health-related behavior, knowledge and attitudes during a 3.4-yr randomized clinical trial and oral health-promotion program. *Eur J Oral Sci* 117(4):390-397.

UIC (2017) Eat Fruits and Veggies For A Healthy Smile. [Online]. University of Illinois at Chicago (UIC) College of Dentistry. Available: https://dentistry.uic.edu/patients/healthy-foods-fruits-veggies [Accessed 22 July 2020].

Vaksman (2018) Why You Should Be Brushing Your Tongue [Online]. Vaksman Dental Group. Available: https://www.drvaksman.com/why-you-should-be-brushing-your-tongue/ [Accessed 23 July 2020].

Vanobbergen J, Declerck D, Mwalili S, Martens L (2004) The effectiveness of a 6-year oral health education programme for primary schoolchildren. *Community Dent Oral Epidemiol* 32(3):173-182.

Verma H, Aggarwal AK, Rattan V, Mohanty U (2012) Access to public dental care facilities in Chandigarh. *Indian J Dent Res* 23(1):121.

Vishwanathaiah S (2016) Knowledge, Attitudes, and Oral Health Practices of School Children in Davangere. *Int J Clin Pediatr Dent* 9(2): 172–176. .

Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M et al. (2012) Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 380(9859):2163-2196.

Watson K (2019) How Often Should You Change Your Toothbrush? Healthy Etiquette. [Online]. Healthline Available: https://www.healthline.com/health/how-often-should-you-change-your-toothbrush [Accessed 23 July 2020].

Watson K (2020) Should You Brush Your Teeth Before or After Breakfast? Pros and Cons. [Online]. Healthline Available: https://www.healthline.com/health/should-you-brush-your-teeth-before-or-after-breakfast [Accessed 23 July 2020].

Watson MR, Horowitz AM, Garcia I, Canto MT (2001) A community participatory oral health promotion program in an inner-city Latino community. *J Public Health Dent* 61(1):34-41.

Watson S (2020) Encourage Healthy Dental Hygiene With a Toothbrushing Chart [Online]. Verywell Health. Available: https://www.verywellhealth.com/free-tooth-brushing-charts-for-children-1059042 [Accessed 26 July 2020].

Werner H, Hakeberg M, Dahlström L, Eriksson M, Sjogren P, Strandell A, Svanberg T, Svensson L, Boman UW (2016) Psychological Interventions for Poor Oral Health: A Systematic Review*J Dent Res* 95(5): 506–514.

WHO (2019a) Oral health [Online]. World Health Organization. Available: https://www.who.int/news-room/fact-sheets/detail/oral-health [Accessed 4 October 2019].

WHO (2019b) What is the burden of oral disease? [Online]. World Health Organization. Available: https://www.who.int/oral_health/disease_burden/global/en/ [Accessed 4 October 2019].

WHO (2020) Health education [Online]. World Health Organization. Available: https://www.who.int/topics/health_education/en/ [Accessed 28 March 2020].

Winning Land Linden GJ (2015) Periodontitis and systemic disease. *BDJ Team* 2(10): 1–4.

LIST OF PUBLICATIONS FROM THE STUDY

1. Suresh N. Ancillary findings during public health research: a researcher's ethical dilemma. Indian J Med Ethics. 2020 Jan-Mar;V(1):22-23. doi: 10.20529/IJME.2020.016. PMID: 32103812

2. Suresh N, Kutty VR, Thankappan KR, Kumar KN, Sarma PS,Vijayan AA. Prevalence of dental caries and gingivitis among 6 -12 year old children in Thiruvananthapuram district, Kerala, India. Acta Sci Dent Sci 5.5 April (2011);109-114.

3. Suresh N, Kutty VR, Thankappan KR, Kumar KN, Sarma PS,Vijayan AA. Teacher's perspectives on development of Oral Health Education Intervention (OHEI) for 6-12 year children in Thiruvananthapuram district, Kerala – A qualitative study. Acta Sci Dent Sci 5.5 April (2011);115-122.

Educational Qualifications

CURRICULUM VITAE

1. Master of Dental Surgery (2011-2014)
    - University: Amrita Vishwa Vidhyapeetham University
    - College: Amrita school of Dentistry, Kochi, Kerala.
    - Class: First class
    - Percentage : 67.33%
2. Bachelor of Dental Surgery (2004-2009)
    - University: University of Kerala
    - College: PMS College of Dental Science and Research, Thiruvananthapuram
    - Class: First class
    - Percentage : 66.7%
3. Certificate courses completed
    i. NPTEL online certification course on Health Research Fundamentals (score 91%)
    ii. eLearning course in Scientific Writing and Reference Management
    iii. Certificate in Laser Dentistry
    iv. Certificate course in Essentials of Palliative Care
    v. Certificate course in Implant Dentistry
4. Qualified UGC NET exam in July 2018

Work experience

1. Reader (03.11.2018 to continuing)
    - Department: Periodontology
    - College: PMS College of Dental Science and Research, Thiruvananthapuram.
2. Senior Lecturer (01.06.2014 to 02.11.2018)
    - Department: Periodontology
    - College: PMS College of Dental Science and Research, Thiruvananthapuram.

Achievements

- District merit scholarship in 2001

- Best paper award for scientific paper presentation at Indian Society of Periodontology (ISP), Workshop on Implantology -INTEGRATE 2012, held at Mahe, Kerala -2012.
- Best paper award for scientific paper presentation at Midterm conference of Society of Periodontists and Implantologists of Kerala (SPIK), held at Kottayam, Kerala -2012.
- Outstanding paper award for scientific paper presentation at the Forum for Advanced Studies and Continuing Education Program (FASCEP), held at Palakkad, Kerala – 2013.
- Best paper award for E-poster at 38th National Conference of Indian Society of Periodontology (ISP), held at Kochi, Kerala, 2013.
- Third prize for scientific paper presentation at Achutha Menon Centre Public Health Conference (AMCCON), held at Thiruvananthapuram, Kerala -2015.
- First prize in the Hindi essay competition conducted by Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala – 2015.
- Second prize in the Hindi hand writing competition conducted by Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala – 2015.
- Travel grant of rupees 1,30,410 by Science and Engineering Research Board (SERB), a Statutory body of the Department of Science and Technology, Government of India for attending the 15th World Congress on Public Health held at Melbourne, Australia – 2017.
- An article was written on everydayhealth.com, New York based on the Gender differences and barriers women face in relation to accessing type 2 diabetes care: A systematic review article.

Publications

1. Prathapachandran J, Suresh N. Management of peri-implantitis. *Dent Res J (Isfahan)*. 2012;9(5):516-521.
2. Perayil J, Suresh N, Fenol A, Vyloppillil R, Bhaskar A, Menon S. Comparison of glycated hemoglobin levels in individuals without diabetes and with and without periodontitis before and after non-surgical periodontal therapy. *J Periodontol*. 2014;85(12):1658-1666.
3. Suresh N, Thankappan KR. Gender differences and barriers women face in relation to accessing type 2 diabetes care: A systematic review. *Indian J Public Health*. 2019;63(1):65-72.
4. Suresh N. Ancillary findings during public health research: a researcher's ethical dilemma. *Indian J Med Ethics*. 2020;V(1):22-23.
5. Suresh N, Kutty VR, Thankappan KR, Kumar KN, Sarma PS,Vijayan AA. Prevalence of dental caries and gingivitis among 6 -12 year old children in Thiruvananthapuram district, Kerala, India. Acta Sci Dent Sci 5.5 April (2011);109-114.
6. Suresh N, Kutty VR, Thankappan KR, Kumar KN, Sarma PS,Vijayan AA. Teacher's perspectives on development of Oral Health Education Intervention (OHEI) for 6-12 year

children in Thiruvananthapuram district, Kerala – A qualitative study. Acta Sci Dent Sci 5.5 April (2011);115-122.

Paper presentations at International Conferences

1. Gender differences in access to diabetes care – A review. AROGYAM Peri-doctoral workshop jointly organised by Achutha Menon Centre For Health Science Studies, SCTIMST and Centre for Social Medicine and Community Health, JNU from March 20 - 22, 2017.
2. Barriers In Accessing Diabetes Care – A Systematic Review. 15th World Congress of Public Health, held at Melbourne, Australia.

APPENDICES

Appendix 1 – Ethics Committee Approval

श्री चित्रा तिरुनाल आयुर्विज्ञान और प्रौद्योगिकी संस्थान, त्रिवेन्द्रम
तिरुवनन्तपुरम - ६९५०११, केरल, इंडिया
SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY, TRIVANDRUM
Thiruvananthapuram - 695 011, Kerala, India
(An Institute of National Importance under Govt. of India)
Grams : Chitramet, Phone : +91-471-2443152, Fax : +91-471-2550728 / 2446433, E-mail : sct@sctimst.ac.in, Website : www.sctimst.ac.in

Institutional Ethics Committee
(IEC Regn No. ECR/189/Inst/KL/2013)

SCT/IEC/1138/DECEMBER-2017 02.01.2018

Dr. Neethu Suresh
PhD Scholar, AMCHSS,
SCTIMST, Thiruvananthapuram

Dear Dr. Neethu Suresh,

The Institutional Ethics Committee reviewed and discussed your application to conduct the study entitled "EFFECTIVENESS OF A SCHOOL ORAL HEALTH EDUCATION INTERVENTION AMONG 6-12 YEAR OLD CHILDREN IN THIRUVANANTHAPURAM EDUCATIONAL DISTRICT: A CLUSTER RANDOMIZED CONTROLLED TRIAL (IEC/1138)" on 16th December, 2017.

The following documents were reviewed:
Original submission

1. *Covering Letter addressed to the Chairperson, IEC, SCTIMST dated 02.11.2017 with checklist*
2. *TAC Approval Letter* 3. *IEC Application Form* 4. *Project Proposal*
5. *Permission letter from Additional Director of Public Instruction*
6. *Focus group discussions with parents – Guidelines, Participant Information Sheet and Consent Form in English and Malayalam*
7. *Focus group discussions with teachers– Guidelines, Participant Information Sheet and Consent Form in English and Malayalam*
8. *Children – Assent Form, Participant Information Sheet and Consent Form in English and Malayalam*
9. *Pre tested structured Interview Schedule in English and MalayalamOral health assessment by clinical examination in English*
10. *In depth interview with parents – Guidelines, Participant Information Sheet and Consent Form in English and Malayalam*
11. *CV of Principal Investigator and Co-Principal Investigators*

Revised submission

1. *Covering Letter addressed to the Chairperson, IEC, SCTIMST dated 01.01.2018 with checklist*
2. *TAC Approval Letter* 3. *IEC Application Form* 4. *Project Proposal*
5. *Permission letter from Additional Director of Public Instruction*
6. *Focus group discussions with parents – Guidelines, Participant Information Sheet and Consent Form in English and Malayalam*
7. *Focus group discussions with teachers– Guidelines, Participant Information Sheet and Consent Form in English and Malayalam*
8. *Children – Assent Form, Participant Information Sheet and Consent Form in English and Malayalam*
9. *Pre tested structured Interview Schedule in English and Malayalam Oral health assessment by clinical examination in English*
10. *In depth interview with parents – Guidelines, Participant Information Sheet and Consent Form in English and Malayalam*
11. *CV of Principal Investigator and Co-Principal Investigators*
12. *Universal report of well-being (Malayalam)*

The following members of the Ethics Committee were present at the meeting held on 16th December, 2017 at G. Parthasarathi Board Room, AMCHSS, SCTIMST

SL. No.	Member Name	Highest Degree	Gender	Scientific /Non Scientific	Affiliation w Institution(
1.	Dr. R V G Menon	M Tech, PhD	Male	Lay Person (Chairman)	No
2.	Dr. Rema M. N	MD	Female	Basic Medical Scientist	No
3.	Dr. S S Giri Sankar	LL.M. Ph.D.	Male	Legal Expert	No
4.	Dr. Aneesh V Pillai	BA. LLB (Hons.), LLM, Ph. D, SET (Law)	Male	Legal Expert	No
5	Mr. Satheesh Chandran	MSW, PGDPM	Male	Lay person/ NGO/ Social Scientist	No
6.	Smt. Sathi Nair	MA (English Literature)	Female	Lay Person	No
7.	Dr. P. Manickam	BSMS, MSc (Epid).,PhD	Male	Health Science Expert/ Social Scientist	No
8.	Dr. Christina George	MD Psychiatry	Female	Clinician	No
9.	Dr. Harikrishnan S	MD, DM (Cardiology) DNB (Cardiology)	Male	Clinician	Yes
10.	Dr. V. Raman Kutty	M D, M Phil, M P H	Male	Health Sciences Expert/Clinician	Yes
11.	Dr. Mala Ramanathan	PhD	Female	Social Scientist (Member Secretary)	Yes

IEC Decision

The IEC approved the conduct of the study in the present form.

Remarks:
The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study, any changes in the protocol and patient information/informed consent and asks to be provided a copy of the final report.

There was no member of the study team who participated in voting / decision making process. The ethics committee is organized and operated according to the requirements of Good Clinical Practice and the requirements of the Indian Council of Medical Research (ICMR).

Sincerely,

Mala Ramanathan
Member Secretary, IEC

Appendix 2 – Approval from Additional Director of Public Instruction

Office of the Director of Public Instruction,
Thiruvananthapuram, dated 08.08.2017.

To

All concerned.

As per the request of Dr.Neethu Suresh MDS(Ph.D Scholar) permission is given to conduct school oral education classes for 6-12 year children in Thiruvananthapuram district without affecting the normal classes of the students.

She must consult with the Deputy Director of Education, Thiruvananthapuram before starting the classes and also with the school HM's of the selected schools.

DIRECTORATE OF PUBLIC INSTRUCTION JAGATHY TVPM-14.

JESSY JOSEPH
Additional Director of Public Instruction (General)

Addl. Director of Public Instruction (General)
Directorate of Public Instruction
Thiruvananthapuram-14

Copy to:

The Deputy Director of Education Thiruvananthapuram
(for necessary action)

Appendix 3 – Approval from Deputy Director of Education, Thiruvananthapuram

ഡി. എഫ് (5)/20569/2017 വിദ്യാഭ്യാസ ഉപ ഡയറക്ടറുടെ കാര്യാലയം,
തിരുവനന്തപുരം, തീയതി: 27.09.2017.

വിദ്യാഭ്യാസ ഉപ ഡയറക്ടർ.

(1) ജില്ലാ വിദ്യാഭ്യാസ ആഫീസർ, തിരുവനന്തപുരം.
(2) എല്ലാ ബന്ധപ്പെട്ട പ്രധമാദ്ധ്യാപകർക്കും.

സർ,

വിഷയം:- പൊതു വിദ്യാഭ്യാസം — 6-12 വയസ്സുള്ള വിദ്യാർത്ഥികൾക്കുള്ള ഓറൽ ഹെൽത്ത് ക്ലാസുകൾ സംഘടിപ്പിക്കുന്നതിന് ശ്രീമതി. ഡോ. നീതു സുരേഷിന് അനുവാദം നൽകുന്നത് — സംബന്ധിച്ച്.

സൂചന:- (1) ശ്രീമതി. ഡോ. നീതു സുരേഷിന്റെ 08.08.2017-ലെ കത്ത്.
(2) പൊതു വിദ്യാഭ്യാസ ഡയറക്ടറുടെ 08.08.2017-ലെ കത്ത്.

******

സൂചന പ്രകാരം തിരുവനന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ തെരഞ്ഞെടുക്കപ്പെട്ട 27 സ്കൂളുകളിലെ 6-12 വയസ്സു വരെയുള്ള വിദ്യാർത്ഥികളിൽ സ്കൂൾ ഓറൽ ഹെൽത്ത് എഡ്യൂക്കേഷൻ (OHE) എന്ന വിഷയത്തിൽ ഗവേഷണ പഠനത്തിന്റെ ഭാഗമായി പഠനം നടത്തുവാൻ അനുവാദം നൽകണമെന്ന് ആവശ്യപ്പെട്ടിരിക്കുന്നു.

കൂടാതെ പ്രസ്തുത പഠനം സംഘടിപ്പിക്കുന്നതിനായി പൊതു വിദ്യാഭ്യാസ ഡയറക്ടർ സൂചന (1) പ്രകാരം അനുവാദം നൽകിയിരിക്കുന്നു. പ്രസ്തുത സാഹചര്യത്തിൽ സ്കൂൾ അദ്ധ്യയന പഠനത്തിന് തടസ്സം വരാതെ 2017 ഡിസംബർ മുതൽ 2018 ഡിസംബർ വരെ തെരഞ്ഞെടുത്തിരിക്കുന്ന സ്കൂളുകളിൽ (OHE) പഠനം നടത്തുവാൻ ശ്രീമതി. നീതു സുരേഷിന് അനുവാദം നൽകുന്നു. ക്ലാസുകൾ ആരംഭിക്കുന്നതിന് മുൻപ് ടിയാൾ ബന്ധപ്പെട്ട സ്കൂൾ പ്രധമാദ്ധ്യാപകരുമായി ചർച്ച് ചെയ്ത് തുടർ നടപടികൾ സ്വീകരിക്കേണ്ടതാണ്.

വിശ്വസ്തതയോടെ,
(ഒപ്പ്)
വിദ്യാഭ്യാസ ഉപ ഡയറക്ടർ

//അംഗീകാരത്തോടെ//

സൂപ്രണ്ട്

എക്കൽ...01/06/2017

sh

Focus group discussions (FGDs) with teachers of 6-12 year old school children
FGD guidelines

1. What comes to your mind when you think of "oral health of children"?

   Explore
   - Oral hygiene practices of children
   - Dietary habits of children
   - Common oral health complaints of children
   - Absenteeism of children from school due to oral health problems
   - Nearby dental care services
   - Dental visits of children
   - Tobacco use among children

2. If we plan a way to teach your students regarding oral health, how do you think we should do it?

   Explore
   - Their expectations regarding the class
   - Suitable time and methods to conduct classes
   - Available facilities in the schools (free periods, class rooms, plug points etc)
   - Their willingness to be part of the program
   - Usefulness of brushing charts

Appendix 4ii – Guidelines for conducting FGDs with teachers of 6-12 old school children (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികളുടെ അദ്ധ്യാപകരുമായി നടത്തുന്ന ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകൾ

ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകളുടെ മാർഗ്ഗനിർദ്ദേശകരേഖകൾ

1. "കുട്ടികളുടെ വായുടെ ആരോഗ്യം" എന്നു ചിന്തിക്കുമ്പോൾ നിങ്ങളുടെ മനസ്സിലേക്കു വരുന്നത് എന്താണ്?

   താഴെ പറയുന്ന കാര്യങ്ങളെക്കുറിച്ച് കൂടുതൽ ആരായുക

   - കുട്ടികളുടെ വായുടെ ശുചിത്വ ശീലങ്ങൾ
   - കുട്ടികളുടെ ആഹാര ശീലങ്ങൾ
   - കുട്ടികളിൽ സാധാരണയായി കാണപ്പെടുന്ന വായുടെ ആരോഗ്യ പ്രശ്നങ്ങൾ
   - വായുടെ ആരോഗ്യ പ്രശ്നങ്ങൾ കാരണം കുട്ടികൾ സ്കൂളിൽ ഹാജരാകാതിരിക്കുക
   - കുട്ടികൾ ദന്ത രോഗവിദഗ്ധനെ സന്ദർശിക്കുന്നത്
   - അടുത്തുള്ള ദന്താരോഗ്യ കേന്ദ്രങ്ങൾ
   - കുട്ടികളിലെ പുകയില ഉപയോഗ ശീലങ്ങൾ

2. നിങ്ങളുടെ വിദ്യാർത്ഥികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള കാര്യങ്ങൾ പറഞ്ഞു കൊടുക്കാൻ ഞങ്ങൾ ഉദ്ദേശിക്കുന്നു, അത് എങ്ങനെ വേണമെന്നാണ് നിങ്ങൾ കരുതുന്നത്?

   താഴെ പറയുന്ന കാര്യങ്ങളെക്കുറിച്ച് കൂടുതൽ ആരായുക

   - ക്ലാസ്സുകളെ കുറിച്ചുള്ള അവരുടെ പ്രതീക്ഷകൾ
   - ക്ലാസ്സെടുക്കാൻ അനുയോജ്യമായ സമയവും മാർഗ്ഗങ്ങളും
   - ലഭ്യമായ സൗകര്യങ്ങൾ (ഒഴിവു സമയങ്ങൾ, ക്ലാസ്സ് മുറികൾ, പ്ലഗ് പോയിന്റുകൾ മുതലായവ)
   - പദ്ധതിയുടെ ഭാഗമാകാൻ അവർക്കുള്ള താത്പര്യം
   - ബ്രഷിങ് ചാർട്ടിൻറെ ഉപയോഗം

Appendix 5i – Guidelines for conducting FGDs with parents of 6-12 old school children (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Focus group discussions (FGDs) with parents of 6-12 year old school children

FGD guidelines

1. What comes to your mind when you think of "oral health of children"?

   Explore
   - Oral hygiene practices of children
   - Dietary habits of children
   - Common oral health complaints of children
   - Absenteeism of children from school due to oral health problems
   - Nearby dental care services
   - Dental visits of children
   - Tobacco use among children

2. If we plan a way to teach your children regarding oral health, how do you think we should do it?

   Explore
   - Their expectations regarding the classes
   - Their willingness to be part of the program
   - Use of mobile phones to reach out to them
   - Usefulness of brushing charts

Appendix 5ii – Guidelines for conducting FGDs with parents of 6-12 old school children (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികളുടെ രക്ഷിതാക്കളുമായി നടത്തുന്ന ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകൾ

ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകളുടെ മാർഗ്ഗനിർദ്ദേശകരേഖകൾ

1. "കുട്ടികളുടെ വായുടെ ആരോഗ്യം" എന്നു ചിന്തിക്കുമ്പോൾ നിങ്ങളുടെ മനസ്സിലേക്കു വരുന്നത് എന്താണ്?

   താഴെ പറയുന്ന കാര്യങ്ങളെക്കുറിച്ച് കൂടുതൽ ആരായുക

   - കുട്ടികളുടെ വായുടെ ശുചിത്വ ശീലങ്ങൾ
   - കുട്ടികളുടെ ആഹാര ശീലങ്ങൾ
   - കുട്ടികളിൽ സാധാരണയായി കാണപ്പെടുന്ന വായുടെ ആരോഗ്യ പ്രശ്നങ്ങൾ
   - വായുടെ ആരോഗ്യ പ്രശ്നങ്ങൾ കാരണം കുട്ടികൾ സ്കൂളിൽ ഹാജരാകാതിരിക്കുക
   - കുട്ടികൾ ദന്ത രോഗവിദഗ്ധനെ സന്ദർശിക്കുന്നത്
   - അടുത്തുള്ള ദന്താരോഗ്യ കേന്ദ്രങ്ങൾ
   - കുട്ടികളിലെ പുകയില ഉപയോഗ ശീലങ്ങൾ

2. നിങ്ങളുടെ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള കാര്യങ്ങൾ പറഞ്ഞു കൊടുക്കാൻ ഞങ്ങൾ ഉദ്ദേശിക്കുന്നു, അത് എങ്ങനെ വേണമെന്നാണ് നിങ്ങൾ കരുതുന്നത്?

   താഴെ പറയുന്ന കാര്യങ്ങളെക്കുറിച്ച് കൂടുതൽ ആരായുക

   - ക്ലാസ്സുകളെ കുറിച്ചുള്ള അവരുടെ പ്രതീക്ഷകൾ
   - ക്ലാസ്സെടുക്കാൻ അനുയോജ്യമായ സമയവും മാർഗ്ഗങ്ങളും
   - പദ്ധതിയുടെ ഭാഗമാകാൻ അവർക്കുള്ള താത്പര്യം
   - അവരുമായി സമ്പർക്കം സ്ഥാപിക്കാൻ മൊബൈൽ ഫോണിൻറെ ഉപഗോയം
   - ബ്രഷിങ് ചാർട്ടിൻറെ ഉപയോഗംഅവരുടെ പ്രതീക്ഷകളും ഉത്കണ്ഠകളും

Appendix 6i – Baseline survey-pretested structured interview schedule (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Baseline survey-pretested structured interview schedule **Unique ID:** | | | | | | |

Section A: General information		
A1	Name of the school	.....
A2	Type of school	1. Government school 2. Government aided school
A3	School code	
A4	Standard	
A5	Division	
A6	Area	1. Urban 2. Rural
A7	Medium of education	1. English 2. Malayalam
A8	Name of class teacher	.....
A9	Phone no: of class teacher	
A10	Name of the child	.....
A11	Father's name	.....
A12	Father's phone no:	
A13	Mother's name	.....
A14	Mother's phone no:	
A15	Address	....

Section B: Socio demographic information			
B1	Child's age in completed years		
B2	Sex	1. Male 2. Female	
B3	Religion [To be noted from school records]	1. Hindu 2. Muslim 3. Christian 4. Others (specify) ……	
B4	Caste [To be noted from school records]	1. General 2. OBC 3. SC 4. ST 5. Others (specify) ……	
B5	Father's occupation	1. Not employed 2. Daily wage worker 3. Agriculture 4. Private employee 5. Government employee 6. Others (specify) …….	
B6	Mother's occupation	1. Not employed 2. Daily wage worker 3. Agriculture 4. Private employee 5. Government employee 6. Others (specify) …….	
B7	House	1. Own 2. Rent	
B8	Roof of house	1. Concrete 2. Tiles 3. Thatch	

Section C: Oral heath related knowledge			
C1	From where do you get information about teeth? [More than one answer can be marked]	1. Parents 2. Teachers 3. Books 4. Television advertisements 5. Radio 6. Friends	☐ ☐ ☐ ☐ ☐ ☐
C2	Which of the following food items can cause dental caries?	1. Sweets 2. Fruits 3. Vegetables 4. Don't know	☐
C3	Which of the following are symptoms of dental caries?	1. Bleeding from gums 2. Toothache 3. Don't know	☐
C4	How can you prevent dental caries?	1. By proper tooth brushing 2. By eating more sweets 3. Don't know	☐
C5	Which of the following are symptoms of gum disease?	1. Bleeding from gums 2. Tooth ache 3. Don't know	☐
C6	How can you prevent gum disease?	1. By proper tooth brushing 2. By eating more sweets 3. Don't know	☐
C7	Which of the following are harmful to oral health?	1. Tobacco products 2. Fruits 3. Vegetables 4. Don't know	☐
C8	Is oral health related to general health of the body?	1. Yes 2. No 3. Don't know	☐

Section D: Oral health related attitude			
D1	Is it necessary to keep your teeth clean?	1. Yes 2. No 3. Don't know	☐
D2	Is regular dental check-up needed for oral health?	1. Yes 2. No 3. Don't know	☐
D3	If you have tooth ache what do you do? [More than one answer can be marked]	1. Visit a doctor 2. Visit a dentist 3. Ignore the pain 4. Salt water gargle 5. Stop tooth brushing 6. Take medication without visiting dentist 7. Brush teeth 8. Wash with ice water 9. Place eucalyptus oil 10. Don't know what to do	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
D4	If you have bleeding from gums what do you do? [More than one answer can be marked]	1. Visit a doctor 2. Visit a dentist 3. Ignore the bleeding 4. Stop tooth brushing 5. Salt water gargle 6. Brush teeth 7. Wash with ice water 8. Wash with water 9. Don't know what to do	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Section E: Oral health related practice			
E1	How often do you clean your teeth?	1. Daily 2. Daily, but sometimes once in 2 days 3. Once in 2 days	☐
E2	Who cleans your teeth?	1. Myself 2. Mother 3. Father 4. Grand mother 5. Grand father 6. Elder brother/sister 7. Myself with the help from another person (specify who is another person) ……	☐
E3	What do you clean your teeth with?	1. Tooth brush and tooth paste 2. Tooth brush and tooth powder 3. Finger and tooth powder 4. Tooth brush, tooth paste and occasionally charcoal 5. Tooth brush, tooth paste and charcoal 6. Tooth brush, tooth paste and occasionally tooth powder 7. Tooth brush, tooth paste and tooth powder 8. Tooth brush, tooth paste, salt and mango leaf [If answer is option 3 go to E9, else go to E4]	☐
E4	How many times do you brush your teeth daily?	1. Once 2. Twice 3. More than twice [If answer is 'once' then go to E5, else go to E6]	☐
E5	Why don't you bush your teeth twice daily?	1. No time 2. I forget 3. I feel lazy	☐
E6	When do you brush your teeth? [More than one answer can be marked]	1. Morning before breakfast 2. Morning after breakfast 3. At night before going to bed 4. Others (specify) ……	☐ ☐ ☐
E7	In which way do you brush your teeth?	1. Sidewise 2. Up and down 3. Circular	☐

E8	When do you change your tooth brush?	1. Once in a month 2. Once in three months 3. Once in six months 4. More than 6 months 5. When bristles wear off
E9	Do you clean your tongue?	1. Yes 2. No [If answer is 'yes' go to E10, else go E11]
E10	How do you clean your tongue?	1. Using tooth brush 2. Using tongue cleaner 3. Using midrib of coconut leaf
E11	Do you always rinse your mouth after food?	1. Yes 2. No [If answer is 'no' go to E12, else go to E13]
E12	Why didn't you always rinse your mouth after food?	1. No time 2. I forget 3. No water available 4. There is no need to rinse the mouth after every meal
E13	How often do you eat sweets?	1. Never 2. Daily 3. Once in 2 – 3 days 4. Once in a week 5. Once in a month
E14	How often do you drink soft drinks like pepsi, coca-cola?	1. Never 2. Daily 3. Once in 2 – 3 days 4. Once in a week 5. Once in a month
E15	Have you ever visited a dentist?	1. Yes 2. No 3. Don't remember [If answer is 'yes' go to E16; if answer is 'no' go to E18, if answer is 'don't remember' go to E20]
E16	When did you last visit a dentist?	1. Less than one month 2. Between 1-6 months 3. More than six months
E17	What was the reason for the last dental visit?	1. Regular dental check-up 2. Tooth pain 3. Bleeding from gums 4. Dental caries 5. Mal positioned teeth 6. Extraction of teeth 7. Fractured teeth 8. Deposits on teeth 9. Missing/unerrupted teeth 10. Don't remember

		[Go to E20]
E18	What is the reason for not visiting a dentist?	1. No tooth problem 2. I am afraid 3. Parents did not take me [If answer is option 2, go to E19, else go to E20]
E19	Why are you afraid to go to dentist?	1. Fear of needle 2. Fear of extraction 3. Fear of dental chair
E20	Have you used any of the tobacco products like cigarettes, beedi, pan-masala, bete quid with arecanut in the last six months?	1. Yes 2. No
E21	Have you taken leave from school in the last three months due to any dental related problems like tooth pain, bleeding from gums?	1. Yes 2. No answer is 'yes' go to E22]
E22	How many days of leave did you take?	1. 1 day 2. 2 days 3. More than 2 days

Appendix 6ii – Baseline survey-pretested structured interview schedule (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

കുട്ടികളുടെ അടിസ്ഥാന വിലയിരുത്തൽ - മുൻകൂട്ടി പരീക്ഷിച്ചിട്ടുള്ള ഘടനാപരമായ അഭിമുഖ പട്ടിക

സവിശേഷ ഐ ഡി: | | | | | | |

ഭാഗം A: പൊതുവായ വിവരങ്ങൾ		
A1	സ്കൂളിൻറെ പേര്	.....
A2	സ്കൂളിൻറെ തരം	1. സർക്കാർ സ്കൂൾ 2. സർക്കാർ സഹായിക്കുന്ന സ്കൂൾ
A3	സ്കൂളിൻറെ കോഡ്	
A4	സ്റ്റാൻഡേർഡ്	
A5	ഡിവിഷൻ	
A6	പ്രദേശം	1. നഗരം 2. ഗ്രാമം
A7	അദ്ധ്യയനഭാഷ	1. ഇംഗ്ലീഷ് 2. മലയാളം
A8	ക്ലാസ് ടീച്ചറിൻറെ പേര്	.....
A9	ക്ലാസ് ടീച്ചറിൻറെ ഫോൺ നമ്പർ	
A10	കുട്ടിയുടെ പേര്	.....
A11	അച്ഛൻറെ പേര്	.....
A12	അച്ഛൻറെ ഫോൺ നമ്പർ	
A13	അമ്മയുടെ പേര്	.....
A14	അമ്മയുടെ ഫോൺ നമ്പർ	
A15	മേൽവിലാസം	.....

ഉത്തരത്തിൻറെ കോഡ് വലതു വശത്തുള്ള ബോക്സിൽ രേഖപ്പെടുത്തുക, ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ രേഖപ്പെടുത്താവുന്ന ചോദ്യങ്ങൾക്ക് തിരഞ്ഞെടുത്ത എല്ലാ ഉത്തരങ്ങളുടെയും വലതു വശത്തുള്ള ബോക്സിൽ 'X' രേഖപ്പെടുത്തുക

ഭാഗം B: സാമൂഹികവും ജനസംഖ്യാപരവുമായ വിവരങ്ങൾ		
B1	കുട്ടിയുടെ പൂർത്തിയായ പ്രായം	
B2	ലിംഗം	1. ആണ് 2. പെണ്ണ്
B3	മതം [സ്കൂൾ രേഖകളിൽ നിന്നും രേഖപ്പെടുത്തുക]	1. ഹിന്ദു 2. മുസ്ലിം 3. ക്രിസ്ത്യാനി 4. മറ്റുള്ളവർ (വ്യക്തമാക്കുക) .....
B4	ജാതി [സ്കൂൾ രേഖകളിൽ നിന്നും രേഖപ്പെടുത്തുക]	1. ജനറൽ 2. മറ്റു പിന്നോക്ക ജാതി 3. പട്ടിക ജാതി 4. പട്ടിക വർഗ്ഗം 5. മറ്റുള്ളവർ (വ്യക്തമാക്കുക) .....
B5	അച്ഛൻറെ ജോലി	1. ജോലി ഇല്ല 2. ദിവസ വേതന തൊഴിലാളി 3. കൃഷി 4. സ്വകാര്യ ജീവനക്കാരൻ 5. സർക്കാർ ഉദ്യോഗസ്ഥൻ മറ്റുള്ളവർ (വ്യക്തമാക്കുക) .....
B6	അമ്മയുടെ ജോലി	1. ജോലി ഇല്ല 2. ദിവസ വേതന തൊഴിലാളി 3. കൃഷി 4. സ്വകാര്യ ജീവനക്കാരൻ 5. സർക്കാർ ഉദ്യോഗസ്ഥൻ മറ്റുള്ളവർ (വ്യക്തമാക്കുക) .....
B7	വീട്	1. സ്വന്തം 2. വാടകയ്ക്ക്
B8	വീടിൻറെ മേൽക്കൂര	1. കോൺക്രീറ്റ് 2. ഓട് 3. ഓല

ഭാഗം C: വായുടെ ആരോഗ്യം സംബന്ധിച്ച അറിവ്			
C1	എവിടെ നിന്നാണ് നിങ്ങൾക്ക് പല്ലിനെ കുറിച്ചുള്ള വിവരങ്ങൾ ലഭിക്കുന്നത്? [ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ രേഖപ്പെടുത്താം]	1. മാതാപിതാക്കൾ 2. അധ്യാപകർ 3. പുസ്തകങ്ങൾ 4. ടീവിയിലെ പരസ്യങ്ങൾ 5. റേഡിയോ 6. കൂട്ടുകാർ	☐ ☐ ☐ ☐ ☐ ☐
C2	ഇനി പറയുന്നതിൽ ഏതൊക്കെ ആഹാര സാധനങ്ങൾ പല്ലിൽ പോട് ഉണ്ടാക്കുന്നു?	1. മിഠായികൾ 2. പഴങ്ങൾ 3. പച്ചക്കറികൾ 4. അറിയില്ല	☐
C3	ഇനി പറയുന്നതിൽ ഏതൊക്കെയാണ് പല്ലിലെ പോടിൻറെ ലക്ഷണങ്ങൾ?	1. മോണയിൽനിന്നും രക്തം വരുക 2. പല്ലു വേദന 3. അറിയില്ല	☐
C4	നിങ്ങൾക്ക് എങ്ങനെ പല്ലിൽ പോട് വരുന്നത് തടയാനാകും?	1. ശരിയായ രീതിയിൽ പല്ലു തേച്ച് 2. കൂടുതൽ മിഠായികൾ കഴിച്ച് 3. അറിയില്ല	☐
C5	ഇനി പറയുന്നതിൽ ഏതൊക്കെയാണ് മോണരോഗത്തിൻറെ ലക്ഷണങ്ങൾ?	1. മോണയിൽനിന്നും രക്തം വരുക 2. പല്ലു വേദന 3. അറിയില്ല	☐
C6	നിങ്ങൾക്ക് എങ്ങനെ മോണരോഗം വരുന്നത് തടയാനാകും?	1. ശരിയായ രീതിയിൽ പല്ലു തേച്ച് 2. കൂടുതൽ മിഠായികൾ കഴിച്ച് 3. അറിയില്ല	☐
C7	ഇനി പറയുന്നതിൽ ഏതൊക്കെയാണ് വായുടെ ആരോഗ്യത്തിനു ദോഷകരമായവ?	1. പുകയില ഉൽപ്പന്നങ്ങൾ 2. പഴങ്ങൾ 3. പച്ചക്കറികൾ 4. അറിയില്ല	☐
C8	വായുടെ ആരോഗ്യത്തിന് ശരീരത്തിൻറെ പൊതുവായ ആരോഗ്യവുമായി ബന്ധമുണ്ടോ?	1. ഉണ്ട് 2. ഇല്ല 3. അറിയില്ല	☐

ഭാഗം D: വായുടെ ആരോഗ്യം സംബന്ധിച്ച നിലപാട്			
D1	പല്ലു വ്യത്തിയായി സൂക്ഷിക്കേണ്ട ആവശ്യം ഉണ്ടോ?	1. ഉണ്ട് 2. ഇല്ല 3. അറിയില്ല	☐
D2	വായുടെ ആരോഗ്യത്തിനായി കൃത്യമായ ദന്ത പരിശോധനയുടെ ആവശ്യം ഉണ്ടോ?	1. ഉണ്ട് 2. ഇല്ല 3. അറിയില്ല	☐
D3	നിങ്ങൾക്ക് പല്ലു വേദന ഉണ്ടെങ്കിൽ നിങ്ങൾ എന്ത് ചെയ്യും? [ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ രേഖപ്പെടുത്താം]	1. ഡോക്ടറെ കാണും 2. ദന്ത ഡോക്ടറെ കാണും 3. വേദന കാര്യമാക്കില്ല 4. ഉപ്പു വെള്ളം കൊണ്ട് വായ് കുലുക്കൊഴിയും 5. പല്ലു തേയ്ക്കുന്നത് നിർത്തും 6. ദന്ത ഡോക്ടറെ കാണാതെതന്നെ മരുന്ന് കഴിക്കും 7. പല്ല് തേയ്ക്കും 8. തണുത്ത വെള്ളം വെച്ച് വായ് കഴുകും 9. പല്ലിൽ യൂക്കാലി എണ്ണ തേയ്ക്കും 10. എന്ത് ചെയ്യണമെന്ന് അറിയില്ല	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
D4	നിങ്ങളുടെ മോണയിൽനിന്നും രക്തം വന്നാൽ നിങ്ങൾ എന്ത് ചെയ്യും? [ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ രേഖപ്പെടുത്താം]	1. ഡോക്ടറെ കാണും 2. ദന്ത ഡോക്ടറെ കാണും 3. രക്തം വരുന്നത് കാര്യമാക്കില്ല 4. പല്ലു തേയ്ക്കുന്നത് നിർത്തും 5. ഉപ്പു വെള്ളം കൊണ്ട് വായ് കുലുക്കൊഴിയും	☐ ☐ ☐ ☐ ☐

		6. പല്ല് തേയ്ക്കും ☐ 7. തണുത്ത വെള്ളം വെച്ച് വായ് കഴുകും ☐ 8. വെള്ളം വെച്ച് വായ് കഴുകും ☐ 9. എന്ത് ചെയ്യണമെന്ന് അറിയില്ല ☐

ഭാഗം E: വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട ശീലങ്ങൾ		
E1	നിങ്ങൾ എത്ര തവണ പല്ല് വൃത്തിയാക്കും?	1. ദിവസവും ☐ 2. ദിവസവും പക്ഷെ ചിലപ്പോൾ 2 ദിവസത്തിൽ ഒരിക്കൽ 3. 2 ദിവസത്തിൽ ഒരിക്കൽ
E2	ആരാണ് നിങ്ങളുടെ പല്ല് വൃത്തിയാക്കുന്നത്?	1. ഞാൻ തന്നെ ☐ 2. അമ്മ 3. അച്ഛൻ 4. മുത്തശ്ശി 5. മുത്തച്ഛൻ 6. മൂത്ത സഹോദരൻ/സഹോദരി 7. മറ്റൊരാളുടെ സഹായത്തോടെ ഞാൻ തന്നെ (മറ്റൊരാൾ ആരാണെന്ന് വ്യക്തമാക്കുക) .....
E3	നിങ്ങൾ എന്ത് ഉപയോഗിച്ചാണ്നിങ്ങളുടെ പല്ല് വൃത്തിയാക്കുന്നത്?	1. ടൂത് ബ്രുഷും ടൂത് പേസ്റ്റും ☐ 2. ടൂത് ബ്രുഷും പൽ പൊടിയും ഉ 3. വിരലും പൽ പൊടിയും 4. ടൂത് ബ്രുഷും ടൂത് പേസ്റ്റും പിന്നെ വല്ലപ്പോഴും ഉമിക്കരിയും 5. ടൂത ബ്രുഷും ടൂത് പേസ്റ്റും ഉമിക്കരിയും 6. ടൂത് ബ്രുഷും ടൂത് പേസ്റ്റും പിന്നെ വല്ലപ്പോഴും പൽ പൊടിയും 7. ടൂത ബ്രുഷും ടൂത് പേസ്റ്റും പൽ പൊടിയും 8. ടൂത് ബ്രുഷും ടൂത് പേസ്റ്റും ഉപ്പും മാവിലയും [ഉത്തരം 3 ആണെങ്കിൽ E9 -ലേക്ക്

		പോകുക, അല്ലെങ്കിൽ E4 - ലേക്ക് പോകുക]
E4	നിങ്ങൾ ദിവസവും എത്ര തവണ പല്ല് ബ്രഷ് ചെയ്യും?	1. ഒരു പ്രാവശ്യം ☐ 2. രണ്ടു പ്രവശ്യം 3. രണ്ടിൽ കൂടുതൽ പ്രാവശ്യം [ഉത്തരം 'ഒരു പ്രാവശ്യം' ആണെങ്കിൽ E5 -ലേക്ക് പോകുക, അല്ലെങ്കിൽ E6 - ലേക്ക് പോകുക]
E5	എന്തു കൊണ്ടാണ് നിങ്ങൾ ദിവസവും രണ്ടു പ്രവശ്യം പല്ല് ബ്രഷ് ചെയ്യാത്തത്?	1. സമയമില്ല ☐ 2. ഞാൻ മറന്നു പോകും 3. എനിക്ക് മടിയാണ്
E6	നിങ്ങൾ എപ്പോഴാണ് പല്ല് ബ്രഷ് ചെയ്യുന്നത്? [ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ രേഖപ്പെടുത്താം]	1. രാവിലെ പ്രഭാതഭക്ഷണത്തിന് മുൻപ് ☐ 2. രാവിലെ പ്രഭാതഭക്ഷണത്തിന് ശേഷം ☐ 3. രാത്രി കിടക്കുന്നതിനു മുൻപ് ☐ 4. മറ്റുള്ളവ (വ്യക്തമാക്കുക) .....
E7	നിങ്ങൾ എങ്ങനെയാണ് പല്ല് തേയ്ക്കുന്നത്?	1. വശങ്ങളിലേക്ക് ☐ 2. മുകളിലേക്കും താഴേക്കും 3. വട്ടത്തിൽ
E8	നിങ്ങൾ എപ്പോഴാണ് നിങ്ങളുടെ ടൂത് ബ്രഷ് മാറ്റുന്നത്?	1. മാസത്തിൽ ഒരിക്കൽ ☐ 2. മൂന്നു മാസത്തിൽ ഒരിക്കൽ 3. ആറു മാസത്തിൽ ഒരിക്കൽ 4. ആറു മാസത്തിൽ കൂടുതൽ 5. ബ്രഷിൻറെ നാരുകൾ ചീത്തയാകുമ്പോൾ
E9	നിങ്ങൾ നിങ്ങളുടെ നാക്ക് വൃത്തിയാക്കാറുണ്ടോ?	1. ഉണ്ട് ☐ 2. ഇല്ല [ഉത്തരം 'ഉണ്ട്' ആണെങ്കിൽ E10 -ലേക്ക് പോകുക, അല്ലെങ്കിൽ E11 - ലേക്ക് പോകുക]
E10	എങ്ങനെയാണ് നിങ്ങൾ നാക്ക് വൃത്തിയാക്കുന്നത്?	1. ടൂത് ബ്രഷ് ഉപയോഗിച്ച് ☐ 2. ടങ്ങ് ക്ലീനർ ഉപയോഗിച്ച് 3. ഈർക്കിൽ ഉപയോഗിച്ച്
E11	ഭക്ഷണത്തിനു ശേഷം എപ്പോഴും	1. ഉണ്ട് ☐

	നിങ്ങൾ വായ് കഴുകാറുണ്ടോ?	2. ഇല്ല [ഉത്തരം 'ഇല്ല' ആണെങ്കിൽ E12-ലേക്ക് പോകുക, അല്ലെങ്കിൽ E13 - ലേക്ക് പോകുക]
E12	എന്തുകൊണ്ടാണ് ഭക്ഷണത്തിനു ശേഷം എപ്പോഴും നിങ്ങൾ വായ് കഴുകാത്തത്?	1. സമയമില്ല 2. ഞാൻ മറന്നു പോകും 3. വെള്ളമില്ല 4. ഭക്ഷണത്തിനു ശേഷം എപ്പോഴും വായ് കഴുകേണ്ട ആവശ്യമില്ല
E13	നിങ്ങൾ എത്ര ഇടവിട്ട് മധുരം കഴിക്കാറുണ്ട്?	1. ഒരിക്കലുമില്ല 2. ദിവസവും 3. 2 - 3 ദിവസത്തിൽ ഒരിക്കൽ 4. ആഴ്ചയിൽ ഒരിക്കൽ 5. മാസത്തിൽ ഒരിക്കൽ
E14	നിങ്ങൾ എത്ര ഇടവിട്ട് പെപ്സി കൊക്കകോള മുതലായ ശീതള പാനീയങ്ങൾ കുടിക്കാറുണ്ട്?	1. ഒരിക്കലുമില്ല 2. ദിവസവും 3. 2 - 3 ദിവസത്തിൽ ഒരിക്കൽ 4. ആഴ്ചയിൽ ഒരിക്കൽ 5. മാസത്തിൽ ഒരിക്കൽ
E15	നിങ്ങൾ എപ്പോഴെങ്കിലും ഒരു ദന്ത ഡോക്ടറെ സന്ദർശിച്ചിട്ടുണ്ടോ?	1. ഉണ്ട് 2. ഇല്ല 3. ഓർക്കുന്നില്ല [ഉത്തരം 'ഉണ്ട്' ആണെങ്കിൽ E16 - ലേക്ക് പോകുക, ഉത്തരം 'ഇല്ല' ആണെങ്കിൽ E18-ലേക്ക് പോകുക, ഉത്തരം 'ഓർക്കുന്നില്ല' ആണെങ്കിൽ E20-ലേക്ക് പോകുക]
E16	നിങ്ങൾ എപ്പോഴാണ് അവസാനമായി ഒരു ദന്ത ഡോക്ടറെ സന്ദർശിച്ചത്?	4. ഒരു മാസത്തിൽ കുറവ് 5. 1-6 മാസത്തിന് ഇടയിൽ 6. ആറു മാസത്തിൽ കൂടുതൽ
E17	നിങ്ങൾ അവസാനമായി ദന്ത ഡോക്ടറെ സന്ദർശിച്ചതിൻറെ കാരണം എന്തായിരുന്നു?	1. പതിവായ ദന്ത പരിശോധന 2. പല്ല് വേദന 3. മോണയിൽനിന്നും രക്തം വന്നത് 4. പല്ലിൽ പോട് 5. നിര തെറ്റിയ പല്ലുകൾ 6. പല്ലെടുക്കാൻ 7. പൊട്ടിയ പല്ല് 8. പല്ലിലെ അഴുക്ക് 9. പല്ല് നഷ്ടപ്പെടുക/ പല്ല് മുളക്കാതിരിക്കുക 10. ഓർക്കുന്നില്ല

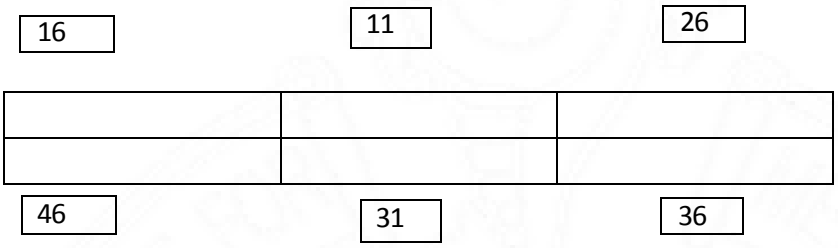
		[E20-ലേക്ക് പോകുക]
E18	നിങ്ങൾ ദന്ത ഡോക്ടറെ സന്ദർശിക്കാത്തതിൻറെ കാരണം എന്താണ്?	1. പല്ലിന് പ്രശ്നമൊന്നും ഇല്ല ☐ 2. എനിക്ക് പേടിയാണ് 3. അച്ഛനും അമ്മയും കൊണ്ടുപോയില്ല [ഉത്തരം 2 ആണെങ്കിൽ E19-ലേക്ക് പോകുക, അല്ലെങ്കിൽ E20 - ലേക്ക് പോകുക]
E19	ദന്ത ഡോക്ടറിൻറെ അടുത്ത് പോകാൻ നിങ്ങൾ എന്തിനാണ് പേടിക്കുന്നത്?	1. സൂചി പേടിയാണ് ☐ 2. പല്ല് എടുക്കുന്നത് പേടിയാണ് 3. ദന്തൽ കസേര പേടിയാണ്
E20	കഴിഞ്ഞ ആറു മാസത്തിൽ സിഗരറ്റ്, ബീഡി, പാൻ മസാല, വെറ്റിലയും പാക്കും മുതലായ ഏതെങ്കിലും പുകയില ഉൽപ്പന്നങ്ങൾ നിങ്ങൾ ഉപയോഗിച്ചിട്ടുണ്ടോ?	1. ഉണ്ട് ☐ 2. ഇല്ല
E21	കഴിഞ്ഞ മൂന്നു മാസത്തിൽ പല്ല് വേദന, മോണയിൽനിന്നും രക്തം വരുക മുതലായ ഏതെങ്കിലും ദന്ത സംബന്ധമായ ബുദ്ധിമുട്ടുകൾ കാരണം നിങ്ങൾ സ്കൂളിൽ നിന്നും അവധി എടുത്തിട്ടുണ്ടോ?	1. ഉണ്ട് ☐ 2. ഇല്ല [ഉത്തരം 'ഉണ്ട്' ആണെങ്കിൽ E22 -ലേക്ക് പോകുക]
E22	നിങ്ങൾ എത്ര ദിവസത്തെ അവധി എടുത്തു?	1. ഒരു ദിവസം ☐ 2. രണ്ടു ദിവസം 3. രണ്ടു ദിവസത്തിൽ കൂടുതൽ

Appendix 7 – Oral health assessment by clinical oral examination

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized

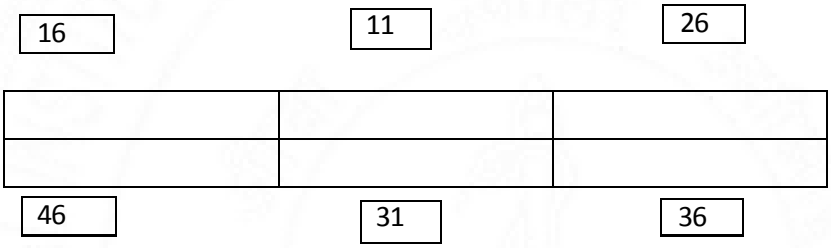
Oral health assessment by clinical oral examination

1. **Simplified Oral Hygiene Index (OHI-S) (Greene & Vermillion 1964)**
   a. **Debris Index - Simplified**



Debris Index (DI) =

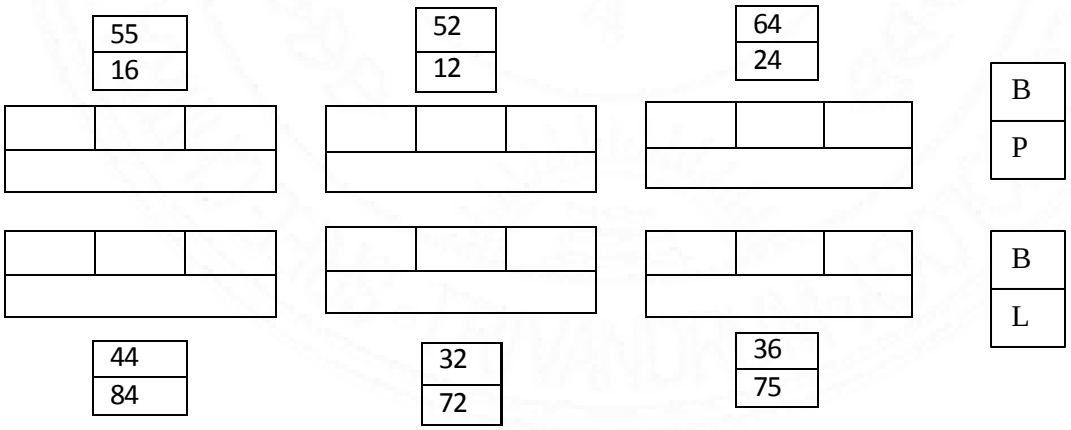
   b. **Calculus Index - Simplified**



Calculus Index (CI) =

Oral Hygiene Index =

2. **Gingival Index (GI) (Loe & Sillness 1963)**



Total score =

3. Decayed-Missing-Filled Teeth Index (DMFT index) (Kelin, Palmer & Knutson 1938)

17	16	15	14	13	12	11	21	22	23	24	25	26	27
47	46	45	44	43	42	41	31	32	33	34	35	36	37

Number of decayed teeth (DT) =

Number of missing teeth due to caries (MT) =

Number of filled teeth (FT) =

Total DMFT score =

4. Decayed-extracted-filled teeth Index (def index) (Grruebbel 1944)

55	54	53	52	51	61	62	63	64	65
85	84	83	82	81	71	72	73	74	75

Number of decayed teeth (dt) =

Number of extracted teeth due to caries (et) =

Number of filled teeth (ft) =

Total def score =

Appendix 8i – Guidelines for conducting IDIs with parents of children who showed extremes of oral hygiene status in the baseline survey (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

In depth interviews with parents of 6-12 year old school children showed extremes of oral hygiene status in the baseline survey

In depth interview guidelines

1. What do you think about the oral health of your child?
   Explore
   - Oral hygiene practices of the child
   - Dietary habits of the child
   - Tobacco use of the child
   - Dental visits of the child

2. How do you take care of your child's oral health?
   Explore
   - Oral hygiene instructions given to the child
   - Teaching of tooth brushing
   - Nearby dental care facilities
   - Difficulties faced in maintaining the oral health of the child (financial or others)

3. What do you think about your oral health and oral health of other family members?
   Explore
   - Common oral health complaints
   - Oral hygiene practices
   - Dental visits
   - Tobacco use

Appendix 8ii – Guidelines for conducting IDIs with parents of children who showed extremes of oral hygiene status in the baseline survey (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

അടിസ്ഥാന പരിശോധനയിൽ വായുടെ ശുചിത്വ സ്ഥിതി ഏറ്റവും നല്ലതും ഏറ്റവും മോശമായും കാണപ്പെട്ട 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികളുടെ രക്ഷിതാക്കളുമായി നടത്തുന്ന ആഴത്തിലുള്ള അഭിമുഖസംഭാഷണം

ആഴത്തിലുള്ള അഭിമുഖസംഭാഷണത്തിൻറെ മാർഗ്ഗനിർദ്ദേശകരേഖകൾ

1. നിങ്ങളുടെ കുട്ടിയുടെ വായുടെ ആരോഗ്യ സ്ഥിതിയെ കുറിച്ച് എന്താണ് വിചാരിക്കുന്നത്?

   താഴെ പറയുന്ന കാര്യങ്ങളെക്കുറിച്ച് കൂടുതൽ ആരായുക

   - കുട്ടിയുടെ വായുടെ ശുചിത്വ ശീലങ്ങൾ
   - കുട്ടിയുടെ ആഹാര ശീലങ്ങൾ കുട്ടിയുടെ
   - പുകയില ഉപയോഗ ശീലങ്ങൾ
   - കുട്ടി ദന്ത രോഗവിദഗ്ധനെ സന്ദർശിക്കുന്നത്

2. നിങ്ങൾ എങ്ങനെയാണ് കുട്ടിയുടെ വായുടെ ആരോഗ്യം സൂക്ഷിക്കുന്നത്?

   താഴെ പറയുന്ന കാര്യങ്ങളെക്കുറിച്ച് കൂടുതൽ ആരായുക
   - വായുടെ ആരോഗ്യ സംരക്ഷണത്തിനായി നൽകുന്ന നിർദ്ദേശങ്ങൾ
   - പല്ലു തേയ്ക്കാൻ പഠിപ്പിക്കുന്നത്
   - സമീപത്ത് ലഭ്യമായ ദന്ത പരിചരണ സൗകര്യങ്ങൾ
   - നേരിടേണ്ടി വന്ന ബുദ്ധിമുട്ടുകൾ (സാമ്പത്തികവും അല്ലാത്തവയും)

3. നിങ്ങളുടെയും നിങ്ങളുടെ വീട്ടിലെ മറ്റംഗങ്ങളുടെയും വായുടെ ആരോഗ്യ സ്ഥിതിയെ കുറിച്ച് എന്താണ് വിചാരിക്കുന്നത്?

   താഴെ പറയുന്ന കാര്യങ്ങളെക്കുറിച്ച് കൂടുതൽ ആരായുക
   - സാധാരണയായി കാണപ്പെടുന്ന വായുടെ ആരോഗ്യ പ്രശ്നങ്ങൾ
   - വായുടെ ശുചിത്വ ശീലങ്ങൾ
   - ദന്ത രോഗവിദഗ്ധനെ സന്ദർശിക്കുന്നത്
   - പുകയില ഉപയോഗം

Appendix 9i – Post intervention survey - structured interview schedule (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Post intervention survey- structured interview schedule **Unique ID:** | | | | | | |

Section A: General information		
A1	Name of the child	.....
A2	Address	....
Write the code of the answer in the box on the right side, in case of questions where more than one answers can be marked, put 'X' mark in the boxes on the right side of the selected answers		

Section B: Oral heath related knowledge			
B1	Which of the following food items can cause dental caries?	1. Sweets 2. Fruits 3. Vegetables 4. Don't know	
B2	Which of the following are symptoms of dental caries?	1. Bleeding from gums 2. Toothache 3. Don't know	
B3	How can you prevent dental caries?	1. By proper tooth brushing 2. By eating more sweets 3. Don't know	
B4	Which of the following are symptoms of gum disease?	1. Bleeding from gums 2. Tooth ache 3. Don't know	
B5	How can you prevent gum disease?	1. By proper tooth brushing 2. By eating more sweets 3. Don't know	
B6	Which of the following are harmful to oral health?	1. Tobacco products 2. Fruits 3. Vegetables 4. Don't know	
B7	Is oral health related to general health of the body?	1. Yes 2. No 3. Don't know	

Section C: Oral health related attitude			
C1	Is it necessary to keep your teeth clean?	1. Yes 2. No 3. Don't know	
C2	Is regular dental check-up needed for oral health?	1. Yes 2. No 3. Don't know	
C3	If you have tooth ache what do you do? [More than one answer can be marked]	1. Visit a doctor 2. Visit a dentist 3. Ignore the pain 4. Salt water gargle 5. Stop tooth brushing 6. Take medication without visiting dentist 7. Brush teeth 8. Wash with ice water 9. Place eucalyptus oil 10. Don't know what to do	
C4	If you have bleeding from gums what do you do? [More than one answer can be marked]	1. Visit a doctor 2. Visit a dentist 3. Ignore the bleeding 4. Stop tooth brushing 5. Salt water gargle 6. Brush teeth 7. Wash with ice water 8. Wash with water 9. Don't know what to do	

Section D: Oral health related practice			
D1	How often do you clean your teeth?	1. Daily 2. Daily, but sometimes once in 2 days 3. Once in 2 days	
D2	Who cleans your teeth?	1. Myself 2. Mother 3. Father 4. Grand mother 5. Grand father 6. Elder brother/sister 7. Myself with the help from another person (specify who is another person) ……	
D3	What do you clean your teeth with?	1. Tooth brush and tooth paste 2. Tooth brush and tooth powder 3. Finger and tooth powder 4. Tooth brush, tooth paste and occasionally charcoal 5. Tooth brush, tooth paste and charcoal 6. Tooth brush, tooth paste and occasionally tooth powder 7. Tooth brush, tooth paste and tooth powder 8. Tooth brush, tooth paste, salt and mango leaf [If answer is option 3 go to D9, else go to D4]	
D4	How many times do you brush your teeth daily?	1. Once 2. Twice 3. More than twice [If answer is 'once' then go to D5, else go to D6]	
D5	Why don't you bush your teeth twice daily?	1. No time 2. I forget 3. I feel lazy	
D6	When do you brush your teeth? [More than one answer can be marked]	1. Morning before breakfast 2. Morning after breakfast 3. At night before going to bed 4. Others (specify) ……	
D7	In which way do you brush your teeth?	1. Sidewise 2. Up and down 3. Circular	
D8	When do you change your tooth brush?	1. Once in a month	

		2. Once in three months 3. Once in six months 4. More than 6 months 5. When bristles wear off
D9	Do you clean your tongue?	3. Yes 4. No [If answer is 'yes' go to D10, else go D11]
D10	How do you clean your tongue?	1. Using tooth brush 2. Using tongue cleaner 3. Using midrib of coconut leaf
D11	Do you always rinse your mouth after food?	1. Yes 2. No [If answer is 'no' go to D12, else go to D13]
D12	Why didn't you always rinse your mouth after food?	1. No time 2. I forget 3. No water available 4. There is no need to rinse the mouth after every meal
D13	How often do you eat sweets?	1. Never 2. Daily 3. Once in 2 – 3 days 4. Once in a week 5. Once in a month
D14	How often do you drink soft drinks like pepsi, coca-cola?	1. Never 2. Daily 3. Once in 2 – 3 days 4. Once in a week 5. Once in a month
D15	Have you ever visited a dentist?	1. Yes 2. No 3. Don't remember [If answer is 'yes' go to D16; if answer is 'no' go to D17, if answer is 'don't remember' go to D19]
D16	What was the reason for the last dental visit?	1. Regular dental check-up 2. Tooth pain 3. Bleeding from gums 4. Dental caries 5. Mal positioned teeth 6. Extraction of teeth 7. Fractured teeth 8. Deposits on teeth 9. Missing/unerrupted teeth 10. Don't remember [Go to D19]
D17	What is the reason for not visiting a dentist?	1. No tooth problem 2. I am afraid 3. Parents did not take me

		[If answer is option 2, go to D18, else go to D19]
D18	Why are you afraid to go to dentist?	1. Fear of needle 2. Fear of extraction 3. Fear of dental chair
D19	Have you used any of the tobacco products like cigarettes, beedi, pan-masala, bete quid with arecanut in the last six months?	1. Yes 2. No
D20	Have you taken leave from school in the last three months due to any dental related problems like tooth pain, bleeding from gums?	1. Yes 2. No [If answer is 'yes' go to D21]
D21	How many days of leave did you take?	1. 1 day 2. 2 days 3. More than 2 days

Appendix 9ii – Post intervention survey- structured interview schedule (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിക്ക് വിലയിരുത്തൽ - ഘടനാപരമായ അഭിമുഖ പട്ടിക

സവിശേഷ ഐ ഡി: | | | | | | |

ഭാഗം A: പൊതുവായ വിവരങ്ങൾ		
A1	കുട്ടിയുടെ പേര്	.....
A2	മേൽവിലാസം	.....

ഉത്തരത്തിൻറെ കോഡ് വലതു വശത്തുള്ള ബോക്സിൽ രേഖപ്പെടുത്തുക, ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ രേഖപ്പെടുത്താവുന്ന ചോദ്യങ്ങൾക്ക് തിരഞ്ഞെടുത്ത എല്ലാ ഉത്തരങ്ങളുടെയും വലതു വശത്തുള്ള ബോക്സിൽ 'X' രേഖപ്പെടുത്തുക

ഭാഗം B: വായുടെ ആരോഗ്യം സംബന്ധിച്ച അറിവ്			
B1	ഇനിപറയുന്നതിൽ ഏതൊക്കെ ആഹാര സാധനങ്ങൾ പല്ലിൽ പോട് ഉണ്ടാക്കുന്നു?	1. മിഠായികൾ 2. പഴങ്ങൾ 3. പച്ചക്കറികൾ 4. അറിയില്ല	
B2	ഇനിപറയുന്നതിൽ ഏതൊക്കെയാണ് പല്ലിലെ പോടിൻറെ ലക്ഷണങ്ങൾ?	1. മോണയിൽനിന്നും രക്തം വരുക 2. പല്ലു വേദന 3. അറിയില്ല	
B3	നിങ്ങൾക്ക് എങ്ങനെ പല്ലിൽ പോട് വരുന്നത് തടയാനാകും?	1. ശരിയായ രീതിയിൽ പല്ലു തേച്ച് 2. കൂടുതൽ മിഠായികൾ കഴിച്ച് 3. അറിയില്ല	
B4	ഇനിപറയുന്നതിൽ ഏതൊക്കെയാണ് മോണരോഗത്തിൻറെ ലക്ഷണങ്ങൾ?	1. മോണയിൽനിന്നും രക്തം വരുക 2. പല്ലു വേദന 3. അറിയില്ല	
B5	നിങ്ങൾക്ക് എങ്ങനെ മോണരോഗം വരുന്നത് തടയാനാകും?	1. ശരിയായ രീതിയിൽ പല്ലു തേച്ച് 2. കൂടുതൽ മിഠായികൾ കഴിച്ച് 3. അറിയില്ല	
B6	ഇനിപറയുന്നതിൽ ഏതൊക്കെയാണ് വായുടെ	1. പുകയില ഉൽപ്പന്നങ്ങൾ 2. പഴങ്ങൾ	

	ആരോഗ്യത്തിനു ദോഷകരമായവ?	3. പച്ചക്കറികൾ 4. അറിയില്ല
B7	വായുടെ ആരോഗ്യത്തിന് ശരീരത്തിൻറെ പൊതുവായ ആരോഗ്യവുമായി ബന്ധമുണ്ടോ?	1. ഉണ്ട് ☐ 2. ഇല്ല 3. അറിയില്ല
	ഭാഗം C: വായുടെ ആരോഗ്യം സംബന്ധിച്ച നിലപാട്	
C1	പല്ലു വൃത്തിയായി സൂക്ഷിക്കേണ്ട ആവശ്യം ഉണ്ടോ?	1. ഉണ്ട് ☐ 2. ഇല്ല 3. അറിയില്ല
C2	വായുടെ ആരോഗ്യത്തിനായി കൃത്യമായ ദന്ത പരിശോധനയുടെ ആവശ്യം ഉണ്ടോ?	1. ഉണ്ട് ☐ 2. ഇല്ല 3. അറിയില്ല
C3	നിങ്ങൾക്ക് പല്ലു വേദന ഉണ്ടെങ്കിൽ നിങ്ങൾ എന്ത് ചെയ്യും? [ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ രേഖപ്പെടുത്താം]	1. ഡോക്ടറെ കാണും ☐ 2. ദന്ത ഡോക്ടറെ കാണും ☐ 3. വേദന കാര്യമാക്കില്ല ☐ 4. ഉപ്പു വെള്ളം കൊണ്ട് വായ് കുലുക്കൊഴിയും ☐ 5. പല്ലു തേയ്ക്കുന്നത് നിർത്തും ☐ 6. ദന്ത ഡോക്ടറെ കാണാതെതന്നെ മരുന്ന് കഴിക്കും ☐ 7. പല്ല് തേയ്ക്കും ☐ 8. തണുത്ത വെള്ളം വെച്ച് വായ് കഴുകും ☐ 9. പല്ലിൽ യൂക്കാലി എണ്ണ തേയ്ക്കും ☐ 10. എന്ത് ചെയ്യണമെന്ന് അറിയില്ല ☐
C4	നിങ്ങളുടെ മോണയിൽനിന്നും രക്തം വന്നാൽ നിങ്ങൾ എന്ത് ചെയ്യും? [ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ രേഖപ്പെടുത്താം]	1. ഡോക്ടറെ കാണും ☐ 2. ദന്ത ഡോക്ടറെ കാണും ☐ 3. രക്തം വരുന്നത് കാര്യമാക്കില്ല ☐ 4. പല്ലു തേയ്ക്കുന്നത് നിർത്തും ☐

		5. ഉപ്പു വെള്ളം കൊണ്ട് വായ് കുലുക്കൊഴിയും ☐ 6. പല്ല് തേയ്ക്കും ☐ 7. തണുത്ത വെള്ളം വെച്ച് വായ് കഴുകും ☐ 8. വെള്ളം വെച്ച് വായ് കഴുകും ☐ 9. എന്ത് ചെയ്യണമെന്ന് അറിയില്ല ☐

ഭാഗം D: വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട ശീലങ്ങൾ		
D1	നിങ്ങൾ എത്ര തവണ പല്ല് വൃത്തിയാക്കും?	1. ദിവസവും 2. ദിവസവും പക്ഷെ ചിലപ്പോൾ 2 ദിവസത്തിൽ ഒരിക്കൽ 3. 2 ദിവസത്തിൽ ഒരിക്കൽ ☐
D2	ആരാണ് നിങ്ങളുടെ പല്ല് വൃത്തിയാക്കുന്നത്?	1. ഞാൻ തന്നെ 2. അമ്മ 3. അച്ഛൻ 4. മുത്തശ്ശി 5. മുത്തച്ഛൻ 6. മൂത്ത സഹോദരൻ/സഹോദരി 7. മറ്റൊരാളുടെ സഹായത്തോടെ ഞാൻ തന്നെ (മറ്റൊരാൾ ആരാണെന്ന് വ്യക്തമാക്കുക)..... ☐
D3	നിങ്ങൾ എന്ത് ഉപയോഗിച്ചാണ് നിങ്ങളുടെ പല്ല് വൃത്തിയാക്കുന്നത്?	1. ടൂത് ബ്രുഷും ടൂത് പേസ്റ്റും 2. ടൂത് ബ്രുഷും പൽ പൊടിയും ഉ 3. വിരലും പൽ പൊടിയും 4. ടൂത് ബ്രുഷും ടൂത് പേസ്റ്റും പിന്നെ വല്ലപ്പോഴും ഉമിക്കരിയും 5. ടൂത ബ്രുഷും ടൂത് പേസ്റ്റും ഉമിക്കരിയും 6. ടൂത് ബ്രുഷും ടൂത് പേസ്റ്റും പിന്നെ വല്ലപ്പോഴും പൽ പൊടിയും 7. ടൂത ബ്രുഷും ടൂത് പേസ്റ്റും പൽ പൊടിയും 8. ടൂത് ബ്രുഷും ടൂത് പേസ്റ്റും ഉപ്പും മാവിലയും ☐ [ഉത്തരം 3 ആണെങ്കിൽ D9 -ലേക്ക് പോകുക, അല്ലെങ്കിൽ D4 - ലേക്ക് പോകുക]

D4	നിങ്ങൾ ദിവസവും എത്ര തവണ പല്ല് ബ്രഷ് ചെയ്യും?	1. ഒരു പ്രാവശ്യം 2. രണ്ടു പ്രവശ്യം 3. രണ്ടിൽ കൂടുതൽ പ്രാവശ്യം [ഉത്തരം 'ഒരു പ്രാവശ്യം' ആണെങ്കിൽ D5 - ലേക്ക് പോകുക, അല്ലെങ്കിൽ D6 - ലേക്ക് പോകുക]
D5	എന്തു കൊണ്ടാണ് നിങ്ങൾ ദിവസവും രണ്ടു പ്രവശ്യം പല്ല് ബ്രഷ് ചെയ്യാത്തത്?	1. സമയമില്ല 2. ഞാൻ മറന്നു പോകും 3. എനിക്ക് മടിയാണ്
D6	നിങ്ങൾ എപ്പോഴാണ് പല്ല് ബ്രഷ് ചെയ്യുന്നത്? [ഒന്നിൽ കൂടുതൽ ഉത്തരങ്ങൾ രേഖപ്പെടുത്താം]	1. രാവിലെ പ്രഭാതഭക്ഷണത്തിന് മുൻപ് 2. രാവിലെ പ്രഭാതഭക്ഷണത്തിന് ശേഷം 3. രാത്രി കിടക്കുന്നതിനു മുൻപ് 4. മറ്റുള്ളവ (വ്യക്തമാക്കുക) .....
D7	നിങ്ങൾ എങ്ങനെയാണ് പല്ല് തേയ്ക്കുന്നത്?	1. വശങ്ങളിലേക്ക് 2. മുകളിലേക്കും താഴേക്കും 3. വട്ടത്തിൽ
D8	നിങ്ങൾ എപ്പോഴാണ് നിങ്ങളുടെ ടൂത് ബ്രഷ് മാറ്റുന്നത്?	1. മാസത്തിൽ ഒരിക്കൽ 2. മൂന്നു മാസത്തിൽ ഒരിക്കൽ 3. ആറു മാസത്തിൽ ഒരിക്കൽ 4. ആറു മാസത്തിൽ കൂടുതൽ 5. ബ്രഷിൻറെ നാരുകൾ ചീത്തയാകുമ്പോൾ
D9	നിങ്ങൾ നിങ്ങളുടെ നാക്ക് വൃത്തിയാക്കാറുണ്ടോ?	1. ഉണ്ട് 2. ഇല്ല [ഉത്തരം 'ഉണ്ട്' ആണെങ്കിൽ D10 -ലേക്ക് പോകുക, അല്ലെങ്കിൽ D11 - ലേക്ക് പോകുക]
D10	എങ്ങനെയാണ് നിങ്ങൾ നാക്ക് വൃത്തിയാക്കുന്നത്?	1. ടൂത് ബ്രഷ് ഉപയോഗിച്ച് 2. ടങ്ങ് ക്ലീനർ ഉപയോഗിച്ച് 3. ഈർക്കിൽ ഉപയോഗിച്ച്
D11	ഭക്ഷണത്തിനു ശേഷം എപ്പോഴും നിങ്ങൾ വായ് കഴുകാറുണ്ടോ?	1. ഉണ്ട് 2. ഇല്ല [ഉത്തരം 'ഇല്ല' ആണെങ്കിൽ D12-ലേക്ക് പോകുക, അല്ലെങ്കിൽ D13 - ലേക്ക് പോകുക]

D12	എന്തുകൊണ്ടാണ് ഭക്ഷണത്തിനു ശേഷം എപ്പോഴും നിങ്ങൾ വായ് കഴുകാത്തത്?	1. സമയമില്ല 2. ഞാൻ മറന്നു പോകും 3. വെള്ളമില്ല 4. ഭക്ഷണത്തിനു ശേഷം എപ്പോഴും വായ് കഴുകേണ്ട ആവശ്യമില്ല
D13	നിങ്ങൾ എത്ര ഇടവിട്ട് മധുരം കഴിക്കാറുണ്ട്?	1. ഒരിക്കലുമില്ല 2. ദിവസവും 3. 2 – 3 ദിവസത്തിൽ ഒരിക്കൽ 4. ആഴ്ചയിൽ ഒരിക്കൽ 5. മാസത്തിൽ ഒരിക്കൽ
D14	നിങ്ങൾ എത്ര ഇടവിട്ട് പെപ്സി കൊക്കകോള മുതലായ ശീതള പാനീയങ്ങൾ കുടിക്കാറുണ്ട്?	1. ഒരിക്കലുമില്ല 2. ദിവസവും 3. 2 – 3 ദിവസത്തിൽ ഒരിക്കൽ 4. ആഴ്ചയിൽ ഒരിക്കൽ 5. മാസത്തിൽ ഒരിക്കൽ
D15	നിങ്ങൾ എപ്പോഴെങ്കിലും ഒരു ദന്ത ഡോക്ടറെ സന്ദർശിച്ചിട്ടുണ്ടോ?	1. ഉണ്ട് 2.ഇല്ല 3. ഓർക്കുന്നില്ല [ഉത്തരം 'ഉണ്ട്' ആണെങ്കിൽ D16 -ലേക്ക് പോകുക, ഉത്തരം 'ഇല്ല' ആണെങ്കിൽ D17-ലേക്ക് പോകുക, ഉത്തരം 'ഓർക്കുന്നില്ല' ആണെങ്കിൽ D19-ലേക്ക് പോകുക]
D16	നിങ്ങൾ അവസാനമായി ദന്ത ഡോക്ടറെ സന്ദർശിച്ചതിൻറെ കാരണം എന്തായിരുന്നു?	1. പതിവായ ദന്ത പരിശോധന 2. പല്ല് വേദന 3. മോണയിൽനിന്നും രക്തം വന്നത് 4. പല്ലിൽ പോട് 5. നിര തെറ്റിയ പല്ലുകൾ 6. പല്ലെടുക്കാൻ 7. പൊട്ടിയ പല്ല് 8. പല്ലിലെ അഴുക്ക് 9. പല്ല് നഷ്ടപ്പെടുക/ പല്ല് മുളക്കാതിരിക്കുക 10. ഓർക്കുന്നില്ല [D19-ലേക്ക് പോകുക]
D17	നിങ്ങൾ ദന്ത ഡോക്ടറെ സന്ദർശിക്കാത്തതിൻറെ കാരണം എന്താണ്?	1. പല്ലിന് പ്രശ്നമൊന്നും ഇല്ല 2. എനിക്ക് പേടിയാണ് 3. അച്ഛനും അമ്മയും കൊണ്ടുപോയില്ല [ഉത്തരം 2 ആണെങ്കിൽ D18-ലേക്ക് പോകുക, അല്ലെങ്കിൽ D19 - ലേക്ക് പോകുക]

D18	ദന്ത ഡോക്ടറ്ിൻറെ അടുത്ത് പോകാൻ നിങ്ങൾ എന്തിനാണ് പേടിക്കുന്നത്?	1. സൂചി പേടിയാണ് 2. പല്ല് എടുക്കുന്നത് പേടിയാണ് 3. ദന്തൽ കസേര പേടിയാണ്	
D19	കഴിഞ്ഞ ആറു മാസത്തിൽ സിഗരറ്റ്, ബീഡി, പാൻ മസാല, വെറ്റിലയും പാക്കും മുതലായ ഏതെങ്കിലും പുകയില ഉൽപ്പന്നങ്ങൾ നിങ്ങൾ ഉപയോഗിച്ചിട്ടുണ്ടോ?	1. ഉണ്ട് 2. ഇല്ല	
D20	കഴിഞ്ഞ മൂന്നു മാസത്തിൽ പല്ല് വേദന, മോണയിൽനിന്നും രക്തം വരുക മുതലായ ഏതെങ്കിലും ദന്ത സംബന്ധമായ ബുദ്ധിമുട്ടുകൾ കാരണം നിങ്ങൾ സ്കൂളിൽ നിന്നും അവധി എടുത്തിട്ടുണ്ടോ?	1. ഉണ്ട് 2. ഇല്ല [ഉത്തരം 'ഉണ്ട്' ആണെങ്കിൽ D21 -ലേക്ക് പോകുക]	
D21	നിങ്ങൾ എത്ര ദിവസത്തെ അവധി എടുത്തു?	1. ഒരു ദിവസം 2. രണ്ടു ദിവസം 3. രണ്ടു ദിവസത്തിൽ കൂടുതൽ	

Appendix 10i – Guidelines for conducting FGDs with teachers of children in the intervention group (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Focus group discussions (FGDs) with teachers of children who received oral health education classes

FGD guidelines

1. Do you think that the oral health education classes were useful for the children?

Explore

- The experience children shared regarding the health education class
- Changes they noticed in the oral hygiene habits of the children
- Usefulness of oral health education materials (charts, pamphlets, and brushing charts)

2. What do you think about the oral health education intervention program?

Explore

- Their opinions regarding the program
- Suggestions for improving the program
- Need for such programs in future

Appendix 10ii – Guidelines for conducting FGDs with teachers of children in the intervention group (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ്സുകൾ ലഭിച്ച കുട്ടികളുടെ അദ്ധ്യാപകരുമായി നടത്തുന്ന ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകൾ

ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകളുടെ മാർഗ്ഗനിർദ്ദേശകരേഖകൾ

1. വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ്സുകൾ കുട്ടികൾക്ക് ഉപകാരപ്പെട്ടതായി നിങ്ങൾ കരുതുന്നുണ്ടോ?
   താഴെ പറയുന്ന കാര്യങ്ങളെക്കുറിച്ച് കൂടുതൽ ആരായുക

   - വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ്സുകളെ പറ്റിയുള്ള കുട്ടികളുടെ അനുഭവങ്ങൾ
   - കുട്ടികളുടെ വായുടെ ശുചിത്വ ശീലങ്ങളിൽ വന്ന മാറ്റങ്ങൾ
   - വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള വിവരങ്ങൾ അടങ്ങിയ ചാർട്ടുകളുടെയും ലേഖകളുടെയും ബ്രഷിങ് ചാർട്ടിൻറെയും പ്രയോജനം

2. കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയെക്കുറിച്ച് നിങ്ങൾ എന്താണ് കരുതുന്നത്?

താഴെ പറയുന്ന കാര്യങ്ങളെക്കുറിച്ച് കൂടുതൽ ആരായുക

- പ്രോഗ്രാമിനെ കുറിച്ചുള്ള നിങ്ങളുടെ അഭിപ്രായം
- പ്രോഗ്രാം മെച്ചപ്പെടുത്താനുള്ള നിങ്ങളുടെ നിർദ്ദേശങ്ങൾ
- ഭാവിയിൽ ഇത്തരം പ്രോഗ്രാമുകളുടെ ആവശ്യം

Appendix 11i – Guidelines for conducting FGDs with parents of children in the intervention group (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Focus group discussions (FGDs) with parents of children who received oral health education classes

FGD guidelines

1. Do you think that the oral health education classes were useful for the children?

Explore

- The experience children shared regarding the health education class
- Changes they noticed in the oral hygiene habits of the children
- Usefulness of oral health education materials (pamphlets and brushing charts)

2. What do you think about the oral health education intervention program?

Explore

- Their opinions regarding the program
- Suggestions for improving the program
- Need for such programs in future

Appendix 11ii – Guidelines for conducting FGDs with parents of children in the intervention group (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ്സുകൾ ലഭിച്ച കുട്ടികളുടെ രക്ഷിതാക്കളുമായി നടത്തുന്ന ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകൾ

ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകളുടെ മാർഗ്ഗനിർദ്ദേശകരേഖകൾ

1. വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ്സുകൾ കുട്ടികൾക്ക് ഉപകാരപ്പെട്ടതായി നിങ്ങൾ കരുതുന്നുണ്ടോ?
   താഴെ പറയുന്ന കാര്യങ്ങളെക്കുറിച്ച് കൂടുതൽ ആരായുക

   - വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ്സുകളെ പറ്റിയുള്ള കുട്ടികളുടെ അനുഭവങ്ങൾ
   - കുട്ടികളുടെ വായുടെ ശുചിത്വ ശീലങ്ങളിൽ വന്ന മാറ്റങ്ങൾ
   - വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള വിവരങ്ങൾ അടങ്ങിയ ലേഖകളുടെയും ബ്രഷിങ് ചാർട്ടിൻറെയും പ്രയോജനം

2. കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയെക്കുറിച്ച് നിങ്ങൾ എന്താണ് കരുതുന്നത്?

താഴെ പറയുന്ന കാര്യങ്ങളെക്കുറിച്ച് കൂടുതൽ ആരായുക

- പ്രോഗ്രാമിനെ കുറിച്ചുള്ള നിങ്ങളുടെ അഭിപ്രായം
- പ്രോഗ്രാം മെച്ചപ്പെടുത്താനുള്ള നിങ്ങളുടെ നിർദ്ദേശങ്ങൾ
- ഭാവിയിൽ ഇത്തരം പ്രോഗ്രാമുകളുടെ ആവശ്യം

Appendix 12i – Participant information sheet for teachers - FGDs with teachers of 6-12 old school children (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Focus group discussions (FGDs) with teachers of 6-12 year old school children

Participant information sheet

I am Neethu Suresh, PhD Scholar from the Achutha Menon Centre for Health Sciences Studies in Sree Chitra Tirunal Institute for Medical Sciences and Technology. I am conducting a study titled "Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial" as part of my PhD program. As part of the study I am planning to conduct oral health education classes for 6-12 year old school children. This discussion will help me to understand the oral health related behaviours and problems of the children. Your suggestions would help me to plan and organize the oral health education classes in an effective way.

If you permit to record this discussion that would be convenient for me to save the time and to ensure all important points from you are duly noted. The recording of this discussion will be kept under safe custody and transcribed without revealing your identity, but only an identifying code. Both the recording and the transcription of the discussion will be used for research purposes only. You are free to quit this discussion at any point of time. If you have any doubt regarding the study please feel free to contact me in the address given below. If you are willing to be a part of this discussion please sign the consent form.
Thank you.

Neethu Suresh (PhD Scholar)
Achutha Menon Centre for Health Sciences Studies
Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum
Phone number: 9895471757

Appendix 12ii – Participant information sheet for teachers - FGDs with teachers of 6-12 old school children (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികളുടെ അദ്ധ്യാപകരുമായി നടത്തുന്ന ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകൾ

പങ്കെടുക്കുന്നവർക്കുള്ള വിവരണ പത്രിക

ഞാൻ നീതു സുരേഷ്. ഞാൻ ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ ഭാഗമായ അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസിലെ ഗവേഷണ വിദ്യാർത്ഥിനിയാണ്. ഗവേഷണത്തിൻറെ ഭാഗമായി ഞാൻ തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ഒരു ശാസ്ത്രീയ പഠനം നടത്തുകയാണ്. പഠനത്തിൻറെ ഭാഗമായി 6-12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്കായി വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ നടത്താൻ ഞാൻ ആലോചിക്കുന്നു. കുട്ടികളുടെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട ശീലങ്ങളും ബുദ്ധിമുട്ടുകളും മനസ്സിലാക്കാൻ ഈ ചർച്ച എന്നെ സഹായിക്കും. വായുടെ ആരോഗ്യത്തെക്കുറിച്ച് കുട്ടികൾക്ക് അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ ഫലപ്രദമായി ആസൂത്രണം ചെയ്യാനും സംഘടിപ്പിക്കാനും താങ്കളുടെ നിർദ്ദേശങ്ങൾ എന്നെ സഹായിക്കും.

ഈ ചർച്ച റെക്കോർഡ് ചെയ്യാൻ താങ്കൾ അനുവദിച്ചാൽ അത് സമയം ലാഭിക്കാൻ എന്നെ സഹായിക്കും മാത്രമല്ല താങ്കൾ പറയുന്ന എല്ലാ പ്രധാനപ്പെട്ട കാര്യങ്ങളും വിട്ടുപോകാതെ രേഖപ്പെടുത്താൻ എനിക്ക് സാധിക്കും. ഈ ചർച്ചയുടെ റെക്കോർഡിങ് സുരക്ഷിതമായി സൂക്ഷിക്കപെടും. താങ്കൾ ആരാണെന്നു വെളിപ്പെടുത്താതെ ഒരു കോഡ് നൽകിയായിരിക്കും ഈ ചർച്ച പകർത്തി എഴുതുക. ഈ ചർച്ചയുടെ റെക്കോർഡിങ്ങും പകർപ്പെഴുത്തും ഗവേഷണാവശ്യത്തിനായി മാത്രമേ ഉപയോഗിക്കുകയുള്ളു. താങ്കൾക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ ചർച്ചയിൽ നിന്നും പിന്മാറാവുന്നതാണ്. ഈ പഠനത്തെക്കുറിച്ച് താങ്കൾക്ക് എന്തെങ്കിലും സംശയമുണ്ടെങ്കിൽ താഴെ കൊടുത്തിരിക്കുന്ന മേൽവിലാസത്തിൽ എന്നെ ബന്ധപ്പെടാം. ഈ ചർച്ചയിൽ പങ്കെടുക്കാൻ താങ്കൾക്ക് സമ്മതമാണെങ്കിൽ ദയവായി സമ്മതപത്രത്തിൽ ഒപ്പ് വെയ്ക്കുക.

നന്ദി.

നീതു സുരേഷ് (ഗവേഷണ വിദ്യാർത്ഥിനി)
അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസ്
ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജി, ട്രിവാൻഡ്രം. ഫോൺ നമ്പർ: 9895471757

Appendix 13i –Consent form for teachers - FGDs with teachers of 6-12 old school children (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Focus group discussions (FGDs) with teachers of 6-12 year old school children

Informed consent

I have read/ been read out the information in participant information sheet. I understand that you are planning to conduct oral health education classes for 6-12 year old school children. I understand that this discussion will help you to understand the oral health related behaviours and problems of the children and the suggestions arising from this discussion would help you to plan and organize the oral health education classes in an effective way. I also understand that you wish to record this discussion and that any information collected from me will be used for the study purpose only. I know that I can withdraw from this discussion at any time. By signing this consent form I voluntarily agree to take part in this discussion.

Participant's name:

Participant's signature:

Date:

Moderator's name:

Moderator's signature:

Date:

Appendix 13ii – Consent form for teachers - FGDs with teachers of 6-12 old school children (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികളുടെ അദ്ധ്യാപകരുമായി നടത്തുന്ന ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകൾ

സമ്മതപത്രം

പങ്കെടുക്കുന്നവർക്കായുള്ള വിവരണ പത്രിക ഞാൻ വായിച്ചു / എന്നെ വായിച്ചു കേൾപ്പിച്ചു. 6-12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്കായി വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ നടത്താൻ താങ്കൾ ആലോചിക്കുന്നതായി ഞാൻ മനസിലാക്കുന്നു. കുട്ടികളുടെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട ശീലങ്ങളും ബുദ്ധിമുട്ടുകളും മനസ്സിലാക്കാൻ ഈ ചർച്ച താങ്കളെ സഹായിക്കുമെന്നും വായുടെ ആരോഗ്യത്തെക്കുറിച്ച് കുട്ടികൾക്ക് അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ ഫലപ്രദമായി ആസൂത്രണം ചെയ്യാനും സംഘടിപ്പിക്കാനും ഈ ചർച്ചയിൽ നിന്നും ഉരുത്തിരിഞ്ഞു വരുന്ന നിർദ്ദേശങ്ങൾ താങ്കളെ സഹായിക്കുമെന്നും ഞാൻ മനസിലാക്കുന്നു. താങ്കൾ ഈ ചർച്ച റെക്കോർഡ് ചെയ്യാൻ ആഗ്രഹിക്കുന്നു എന്നും എൻറെ പക്കൽ നിന്നും ശേഖരിക്കുന്ന വിവരങ്ങൾ പഠനാവശ്യത്തിനായി മാത്രമേ ഉപയോഗിക്കുകയുള്ളു എന്നും ഞാൻ മനസിലാക്കുന്നു. എനിക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ ചർച്ചയിൽ നിന്നും പിന്മാറാം എന്ന് എനിക്ക് അറിയാം. ഈ സമ്മതപത്രം ഒപ്പ് വയ്ക്കുന്നത് വഴി ഈ ചർച്ചയിൽ പങ്കെടുക്കാൻ ഞാൻ സ്വമേധയാ സമ്മതിക്കുന്നു.

പങ്കെടുക്കുന്ന ആളിൻറെ പേര്:

പങ്കെടുക്കുന്ന ആളിൻറെ ഒപ്പ് / വിരലടയാളം: തീയതി:

ചർച്ച നയിക്കുന്ന ആളിൻറെ പേര്:

ചർച്ച നയിക്കുന്ന ആളിൻറെ ഒപ്പ്: തീയതി:

Appendix 14i – Participant information sheet for parents - FGDs with parents of 6-12 old school children (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Focus group discussions (FGDs) with parents of 6-12 year old school children

Participant information sheet

I am Neethu Suresh, PhD Scholar from the Achutha Menon Centre for Health Sciences Studies in Sree Chitra Tirunal Institute for Medical Sciences and Technology. I am conducting a study titled "Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial" as part of my PhD program. As part of the study I am planning to conduct oral health education classes for 6-12 year old school children. This discussion will help me to understand the oral health related behaviours and problems of the children. Your suggestions would help me to plan and organize the oral health education classes in an effective way.

If you permit to record this discussion that would be convenient for me to save the time and to ensure all important points from you are duly noted. The recording of this discussion will be kept under safe custody and transcribed without revealing your identity, but only an identifying code. Both the recording and the transcription of the discussion will be used for research purposes only. You are free to quit this discussion at any point of time. If you have any doubt regarding the study please feel free to contact me in the address given below. If you are willing to be a part of this discussion please sign the consent form.
Thank you.

Neethu Suresh (PhD Scholar)
Achutha Menon Centre for Health Sciences Studies
Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum
Phone number: 9895471757

Appendix 14ii – Participant information sheet for parents - FGDs with parents of 6-12 old school children (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികളുടെ രക്ഷിതാക്കളുമായി നടത്തുന്ന ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകൾ

പങ്കെടുക്കുന്നവർക്കുള്ള വിവരണ പത്രിക

ഞാൻ നീതു സുരേഷ്. ഞാൻ ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ ഭാഗമായ അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസിലെ ഗവേഷണ വിദ്യാർത്ഥിനിയാണ്. ഗവേഷണത്തിൻറെ ഭാഗമായി ഞാൻ തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ഒരു ശാസ്ത്രീയ പഠനം നടത്തുകയാണ്. പഠനത്തിൻറെ ഭാഗമായി 6-12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്കായി വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ നടത്താൻ ഞാൻ ആലോചിക്കുന്നു. കുട്ടികളുടെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട ശീലങ്ങളും ബുദ്ധിമുട്ടുകളും മനസ്സിലാക്കാൻ ഈ ചർച്ച എന്നെ സഹായിക്കും. വായുടെ ആരോഗ്യത്തെക്കുറിച്ച് കുട്ടികൾക്ക് അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ ഫലപ്രദമായി ആസൂത്രണം ചെയ്യാനും സംഘടിപ്പിക്കാനും താങ്കളുടെ നിർദ്ദേശങ്ങൾ എന്നെ സഹായിക്കും.

ഈ ചർച്ച റെക്കോർഡ് ചെയ്യാൻ താങ്കൾ അനുവദിച്ചാൽ അത് സമയം ലാഭിക്കാൻ എന്നെ സഹായിക്കും മാത്രമല്ല താങ്കൾ പറയുന്ന എല്ലാ പ്രധാനപ്പെട്ട കാര്യങ്ങളും വിട്ടുപോകാതെ രേഖപ്പെടുത്താൻ എനിക്ക് സാധിക്കും. ഈ ചർച്ചയുടെ റെക്കോർഡിങ് സുരക്ഷിതമായി സൂക്ഷിക്കപെടും. താങ്കൾ ആരാണെന്നു വെളിപ്പെടുത്താതെ ഒരു കോഡ് നൽകിയായിരിക്കും ഈ ചർച്ച പകർത്തി എഴുതുക. ഈ ചർച്ചയുടെ റെക്കോർഡിങ്ങും പകർപ്പെഴുത്തും ഗവേഷണാവശ്യത്തിനായി മാത്രമേ ഉപയോഗിക്കുകയുള്ളു. താങ്കൾക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ ചർച്ചയിൽ നിന്നും പിന്മാറാവുന്നതാണ്. ഈ പഠനത്തെക്കുറിച്ച് താങ്കൾക്ക് എന്തെങ്കിലും സംശയമുണ്ടെങ്കിൽ താഴെ കൊടുത്തിരിക്കുന്ന മേൽവിലാസത്തിൽ എന്നെ ബന്ധപ്പെടാം. ഈ ചർച്ചയിൽ പങ്കെടുക്കാൻ താങ്കൾക്ക് സമ്മതമാണെങ്കിൽ ദയവായി സമ്മതപത്രത്തിൽ ഒപ്പ് വെയ്ക്കുക.

നന്ദി.

നീതു സുരേഷ് (ഗവേഷണ വിദ്യാർത്ഥിനി)
അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസ്
ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജി, ട്രിവാൻഡ്രം. ഫോൺ നമ്പർ: 9895471757

Appendix 15i – Consent form for parents - FGDs with parents of 6-12 old school children (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Focus group discussions (FGDs) with parents of 6-12 year old school children

Informed consent

I have read/ been read out the information in participant information sheet. I understand that you are planning to conduct oral health education classes for 6-12 year old school children. I understand that this discussion will help you to understand the oral health related behaviours and problems of the children and the suggestions arising from this discussion would help you to plan and organize the oral health education classes in an effective way. I also understand that you wish to record this discussion and that any information collected from me will be used for the study purpose only. I know that I can withdraw from this discussion at any time. By signing this consent form I voluntarily agree to take part in this discussion.

Participant's name:

Participant's signature:

Date:

Moderator's name:

Moderator's signature:

Date:

Appendix 15ii – Consent form for parents - FGDs with parents of 6-12 old school children (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികളുടെ രക്ഷിതാക്കളുമായി നടത്തുന്ന ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകൾ

സമ്മതപത്രം

പങ്കെടുക്കുന്നവർക്കായുള്ള വിവരണ പത്രിക ഞാൻ വായിച്ചു / എന്നെ വായിച്ചു കേൾപ്പിച്ചു. 6-12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്കായി വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ നടത്താൻ താങ്കൾ ആലോചിക്കുന്നതായി ഞാൻ മനസിലാക്കുന്നു. കുട്ടികളുടെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട ശീലങ്ങളും ബുദ്ധിമുട്ടുകളും മനസ്സിലാക്കാൻ ഈ ചർച്ച താങ്കളെ സഹായിക്കുമെന്നും വായുടെ ആരോഗ്യത്തെക്കുറിച്ച് കുട്ടികൾക്ക് അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ ഫലപ്രദമായി ആസൂത്രണം ചെയ്യാനും സംഘടിപ്പിക്കാനും ഈ ചർച്ചയിൽ നിന്നും ഉരുത്തിരിഞ്ഞു വരുന്ന നിർദ്ദേശങ്ങൾ താങ്കളെ സഹായിക്കുമെന്നും ഞാൻ മനസിലാക്കുന്നു. താങ്കൾ ഈ ചർച്ച റെക്കോർഡ് ചെയ്യാൻ ആഗ്രഹിക്കുന്നു എന്നും എൻറെ പക്കൽ നിന്നും ശേഖരിക്കുന്ന വിവരങ്ങൾ പഠനാവശ്യത്തിനായി മാത്രമേ ഉപയോഗിക്കുകയുള്ളു എന്നും ഞാൻ മനസിലാക്കുന്നു. എനിക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ ചർച്ചയിൽ നിന്നും പിന്മാറാം എന്ന് എനിക്ക് അറിയാം. ഈ സമ്മതപത്രം ഒപ്പ് വയ്ക്കുന്നത് വഴി ഈ ചർച്ചയിൽ പങ്കെടുക്കാൻ ഞാൻ സ്വമേധയാ സമ്മതിക്കുന്നു.

പങ്കെടുക്കുന്ന ആളിൻറെ പേര്:

പങ്കെടുക്കുന്ന ആളിൻറെ ഒപ്പ് / വിരലടയാളം: തീയതി:

ചർച്ച നയിക്കുന്ന ആളിൻറെ പേര്:

ചർച്ച നയിക്കുന്ന ആളിൻറെ ഒപ്പ്: തീയതി:

Appendix 16i – Participant information sheet for parents - Baseline survey and clinical oral examination among children (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Baseline survey and clinical oral examination among children

Participant information sheet for parents

I am Dr. Neethu Suresh, PhD Scholar from the Achutha Menon Centre for Health Sciences Studies in Sree Chitra Tirunal Institute for Medical Sciences and Technology. I am conducting a study titled "Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial" as part of my PhD program. As part of the study I am planning to conduct oral health education classes for the children, before doing so I need to understand the current oral health related knowledge, attitude and practices of children and also their oral health problems.

I am inviting your child to participate in this study. If you agree to let your child participate in this study, I will ask your child some simple questions regarding his/her oral health related knowledge, attitude and practices. I would also like to examine your child's mouth.

Your child's participation in this study is entirely voluntary after giving his/ her assent. You or your child can quit from this study at any time. It will not affect you or your child in any way.

There is no risk to your child if he/she participates in the study. Some children may experience mild discomfort while oral examination.

Your child's personal information will not be revealed in any publication or reports related to the study. Only people associated with the study will have access to the personal information of the child.

If you have any doubt regarding the study please feel free to contact me directly (Phone number: 9895471757). In case you wish to seek any clarification regarding this study, you can contact the member-secretary of the Institute Ethics Committee of Sree Chitra Tirunal Institute for Medical Sciences and Technology (Dr Mala Ramanathan, phone number: 0471-2524234).

If you are willing to let your child take part in the study, please sign the consent form and return it with the child as early as possible.

Signature of the researcher: Date:

Appendix 16ii – Participant information sheet for parents - Baseline survey and clinical oral examination among children (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

കുട്ടികളുടെ അടിസ്ഥാന വിലയിരുത്തലും വായുടെ പരിശോധനയും

രക്ഷിതാക്കൾക്കുള്ള വിവരണ പത്രിക

ഞാൻ ഡോക്ടർ നീതു സുരേഷ്. ഞാൻ ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ ഭാഗമായ അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസിലെ ഗവേഷണ വിദ്യാർത്ഥിനിയാണ്. ഗവേഷണത്തിൻറെ ഭാഗമായി ഞാൻ തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ഒരു ശാസ്ത്രീയ പഠനം നടത്തുകയാണ്. പഠനത്തിന്റെ ഭാഗമായി കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ നടത്താൻ ഞാൻ ആലോചിക്കുന്നു. അതിനിമുൻപ് വായുടെ ആരോഗ്യത്തെ സംബന്ധിച്ച കുട്ടികളുടെ നിലവിലുള്ള അറിവും നിലപാടുകളും ശീലങ്ങളും അറിയണം, അവരുടെ വായുടെ നിലവിലെ ആരോഗ്യ സ്ഥിതിയും അറിയണം.

ഈ പഠനത്തിൻറെ ഭാഗമാകാൻ ഞാൻ താങ്കളുടെ കുട്ടിയെ ക്ഷണിക്കുകയാണ്. ഈ പഠനത്തിൽ പങ്കെടുക്കാൻ താങ്കൾ താങ്കളുടെ കുട്ടിയെ അനുവദിച്ചാൽ, ഞാൻ താങ്കളുടെ കുട്ടിയോട് അവരുടെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവുകളെയും നിലപാടുകളെയും ശീലങ്ങളെയും ബുദ്ധിമുട്ടുകളെയും കുറിച്ചുള്ള ചില ലളിതമായ ചോദ്യങ്ങൾ ചോദിക്കും. താങ്കളുടെ കുട്ടിയുടെ വായ് പരിശോധിക്കാനും ഞാൻ ആഗ്രഹിക്കുന്നു.

ഈ പഠനത്തിനുള്ള താങ്കളുടെ കുട്ടിയുടെ പങ്കാളിത്തം അവരുടെ സമ്മതത്തോടുകൂടി തികച്ചും സ്വമേധയ ആയിരിക്കും. തങ്ങൾക്കോ താങ്കളുടെ കുട്ടിക്കോ എപ്പോൾ വേണമെങ്കിലും ഈ പഠനത്തിൽ നിന്നും പിന്മാറാവുന്നതാണ്. താങ്കളെയോ താങ്കളുടെ കുട്ടിയെയോ അത് ഒരു തരത്തിലും ബാധിക്കുകയില്ല.

ഈ പഠനത്തിൽ പങ്കെടുത്തതുകൊണ്ട് താങ്കളുടെ കുട്ടിക്ക് ഒരു ബുദ്ധിമുട്ടും ഉണ്ടാകില്ല. വായ് പരിശോധിക്കുമ്പോൾ ചില കുട്ടികൾക്ക് ചെറിയ പ്രയാസം തോന്നിയേക്കാം.

ഈ പഠനവുമായി ബന്ധപ്പെട്ട പ്രസിദ്ധികരണങ്ങളിലോ റിപ്പോർട്ടുകളിലോ താങ്കളുടെ കുട്ടിയുടെ വ്യക്തിപരമായ വിവരങ്ങൾ വെളിപ്പെടുത്തുകയില്ല. ഈ പഠനവുമായി ബന്ധപ്പെട്ട ആളുകൾക്ക് മാത്രമേ താങ്കളുടെ കുട്ടിയുടെ വ്യക്തിപരമായ വിവരങ്ങൾ ലഭ്യമാകുകയുള്ളു.

ഈ പഠനവുമായി ബന്ധപ്പെട്ട് താങ്കൾക്ക് എന്തെങ്കിലും സംശയങ്ങൾ ഉണ്ടെങ്കിൽ താങ്കൾക്ക് എന്നെ നേരിട്ട് വിളിക്കാവുന്നതാണ്. (ഫോൺ നമ്പർ: 9895471757). ഈ പഠനവുമായി ബന്ധപ്പെട്ട് താങ്കൾക്ക് എന്തെങ്കിലും വിശദികരണം ആവശ്യമാണെങ്കിൽ

താങ്കൾക്ക് ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ നീതിനിർവാഹകസമിതി മെമ്പർ സെക്രട്ടറി ആയ ഡോ. മാല രാമനാഥനെ ഫോണിൽ വിളിക്കാവുന്നതാണ് (0471-2524234).

താങ്കളുടെ കുട്ടി ഈ പഠനത്തിൽ പങ്കെടുക്കുന്നത് താങ്കൾക്ക് സമ്മതമാണെങ്കിൽ ദയവായി സമ്മതപത്രത്തിൽ ഒപ്പ് വെച്ചതിനുശേഷം സമ്മതപത്രം തങ്ങളുടെ കുട്ടിയുടെ കൈവശം കൊടുത്തു വിടുക.

പഠനം നടത്തുന്ന ആളിൻറെ ഒപ്പ്: തീയതി:

Appendix 17i – Consent form for parents - Baseline survey and clinical oral examination among children (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Baseline survey and clinical oral examination among children

Informed consent form for parents

I have received a signed copy of the participant information sheet and I have read the information in it. I understand that if my child participates in this study, you will ask my child some simple questions regarding his/her oral health related knowledge, attitude and practices; and you would also examine my child's mouth. I know that my child or I can withdraw from this study at any time and it will not affect us in any way. I understand that my child's personal information will not be revealed in any publication or reports related to the study. By signing this consent form I voluntarily permit my child to take part in this study.

I, _____ father / mother / guardian of _____ voluntarily permit my child to take part in this study.

Date:

Appendix 17ii – Consent form for parents - Baseline survey and clinical oral examination among children (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

കുട്ടികളുടെ അടിസ്ഥാന വിലയിരുത്തലും വായുടെ പരിശോധനയും

രക്ഷിതാക്കളുടെ സമ്മതപത്രം

പങ്കെടുക്കുന്നവർക്കായുള്ള ഒപ്പ് വെച്ച വിവരണ പത്രിക എനിക്ക് കിട്ടി, അതിലെ വിവരങ്ങൾ ഞാൻ വായിച്ചു. ഈ പഠനത്തിൽ പങ്കെടുക്കാൻ ഞാൻ എൻറെ കുട്ടിയെ അനുവദിച്ചാൽ, താങ്കൾ എൻറെ കുട്ടിയോട് അവരുടെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവുകളെയും നിലപാടുകളെയും ശീലങ്ങളെയും ബുദ്ധിമുട്ടുകളെയും കുറിച്ചുള്ള ചില ലളിതമായ ചോദ്യങ്ങൾ ചോദിക്കുമെന്നും താങ്കൾ എൻറെ കുട്ടിയുടെ വായ് പരിശോധിക്കുമെന്നും ഞാൻ മനസിലാക്കുന്നു. എനിക്കോ എൻറെ കുട്ടിക്കോ എപ്പോൾ വേണമെങ്കിലും ഈ പഠനത്തിൽ നിന്നും പിന്മാറാവുന്നതാണെന്നും എന്നെയോ എൻറെ കുട്ടിയെയോ അത് ഒരു തരത്തിലും ബാധിക്കുകയില്ല എന്നും ഞാൻ മനസിലാക്കുന്നു. ഈ പഠനവുമായി ബന്ധപ്പെട്ട പ്രസിദ്ധികരണങ്ങളിലോ റിപ്പോർട്ടുകളിലോ എൻറെ കുട്ടിയുടെ വ്യക്തിപരമായ വിവരങ്ങൾ വെളിപ്പെടുത്തുകയില്ല എന്ന് ഞാൻ മനസിലാക്കുന്നു. ഈ സമ്മതപത്രം ഒപ്പ് വയ്ക്കുന്നത് വഴി എൻറെ കുട്ടിയെ ഈ പഠനത്തിൽ പങ്കെടുപ്പിക്കാൻ ഞാൻ സ്വമേധയാ സമ്മതിക്കുന്നു.

എൻറെ പേര് _____ എന്നാണ്.

ഞാൻ _____ എന്ന കുട്ടിയുടെ അച്ഛൻ / അമ്മ / രക്ഷിതാവ് ആണ്. എൻറെ കുട്ടിയെ ഈ പഠനത്തിൽ പങ്കെടുപ്പിക്കാൻ ഞാൻ സ്വമേധയാ സമ്മതിക്കുന്നു.

തീയതി:

Appendix 18i – Participant information sheet for children - Baseline survey and clinical oral examination among children (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Baseline survey and clinical oral examination among children

Participant information sheet for children

I am Dr. Neethu Suresh, PhD Scholar from the Achutha Menon Centre for Health Sciences Studies in Sree Chitra Tirunal Institute for Medical Sciences and Technology. I am conducting a study titled "Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial" as part of my PhD program. As part of the study I am planning to conduct oral health education classes for the children, before doing so I need to understand the current oral health related knowledge, attitude and practices of children and also their oral health problems.

I am inviting you to participate in this study. If you agree to participate in this study, I will ask you some simple questions regarding your oral health related knowledge, attitude and practices. I would also like to examine your mouth.

Your participation in this study is entirely voluntary after giving your assent. You can quit from this study at any time. It will not affect your study in any way.

There is no risk to you if you participate in the study. Some children may experience mild discomfort while oral examination.

Your personal information will not be revealed in any publication or reports related to the study. Only people associated with the study will have access to your personal information.

If you have any doubt regarding the study please feel free to tell your parents or teachers to contact me directly (Phone number: 9895471757). In case your parents or teachers wish to seek any clarification regarding this study, they can contact the member- secretary of the Institute Ethics Committee of Sree Chitra Tirunal Institute for Medical Sciences and Technology (Dr Mala Ramanathan, phone number: 0471-2524234).

Your parents are aware of this study. If you are willing to take part in the study, please give your say so by writing your name in the assent form and return it.

Signature of the researcher: Date:

Appendix 18ii – Participant information sheet for children - Baseline survey and clinical oral examination among children (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

കുട്ടികളുടെ അടിസ്ഥാന വിലയിരുത്തലും വായുടെ പരിശോധനയും

കുട്ടികൾക്കുള്ള വിവരണ പത്രിക

ഞാൻ ഡോക്ടർ നീതു സുരേഷ്. ഞാൻ ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ ഭാഗമായ അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസിലെ ഗവേഷണ വിദ്യാർത്ഥിനിയാണ്. ഗവേഷണത്തിൻറെ ഭാഗമായി ഞാൻ തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ഒരു ശാസ്ത്രീയ പഠനം നടത്തുകയാണ്. പഠനത്തിന്റെ ഭാഗമായി കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ നടത്താൻ ഞാൻ ആലോചിക്കുന്നു. അതിനിമുൻപ് വായുടെ ആരോഗ്യത്തെ സംബന്ധിച്ച കുട്ടികളുടെ നിലവിലുള്ള അറിവും നിലപാടുകളും ശീലങ്ങളും അറിയണം, അവരുടെ വായുടെ നിലവിലെ ആരോഗ്യ സ്ഥിതിയും അറിയണം.

ഈ പഠനത്തിൻറെ ഭാഗമാകാൻ ഞാൻ നിങ്ങളെ ക്ഷണിക്കുകയാണ്. ഈ പഠനത്തിൽ പങ്കെടുത്താൽ ഞാൻ നിങ്ങളോട് നിങ്ങളുടെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവുകളെയും നിലപാടുകളെയും ശീലങ്ങളെയും ബുദ്ധിമുട്ടുകളെയും കുറിച്ചുള്ള ചില ലളിതമായ ചോദ്യങ്ങൾ ചോദിക്കും. നിങ്ങളുടെ വായ് പരിശോധിക്കാനും ഞാൻ ആഗ്രഹിക്കുന്നു.

ഈ പഠനത്തിനുള്ള നിങ്ങളുടെ പങ്കാളിത്തം നിങ്ങളുടെ സമ്മതത്തോടുകൂടി തികച്ചും സ്വമേധയ ആയിരിക്കും. നിങ്ങൾക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ പഠനത്തിൽ നിന്നും പിന്മാറാവുന്നതാണ്. നിങ്ങളുടെ പഠനത്തെ അത് ഒരു തരത്തിലും ബാധിക്കുകയില്ല.

ഈ പഠനത്തിൽ പങ്കെടുത്തതുകൊണ്ട് നിങ്ങൾക്ക് ഒരു ബുദ്ധിമുട്ടും ഉണ്ടാകില്ല. വായ് പരിശോധിക്കുമ്പോൾ ചില കുട്ടികൾക്ക് ചെറിയ പ്രയാസം തോന്നിയേക്കാം.

ഈ പഠനവുമായി ബന്ധപ്പെട്ട പ്രസിദ്ധികരണങ്ങളിലോ റിപ്പോർട്ടുകളിലോ നിങ്ങളുടെ വ്യക്തിപരമായ വിവരങ്ങൾ വെളിപ്പെടുത്തുകയില്ല. ഈ പഠനവുമായി ബന്ധപ്പെട്ട ആളുകൾക്ക് മാത്രമേ നിങ്ങളുടെ വ്യക്തിപരമായ വിവരങ്ങൾ ലഭ്യമാകുകയുള്ളു.

ഈ പഠനവുമായി ബന്ധപ്പെട്ട് നിങ്ങൾക്ക് എന്തെങ്കിലും സംശയങ്ങൾ ഉണ്ടെങ്കിൽ നിങ്ങൾക്ക് നിങ്ങളുടെ രക്ഷിതാക്കളോടോ അധ്യാപകരോടോ എന്നെ നേരിട്ട് വിളിക്കാൻ പറയാവുന്നതാണ്. (ഫോൺ നമ്പർ: 9895471757). ഈ പഠനവുമായി ബന്ധപ്പെട്ട് നിങ്ങളുടെ രക്ഷിതാക്കൾക്കോ അധ്യാപകർക്കോ എന്തെങ്കിലും വിശദികരണം ആവശ്യമാണെങ്കിൽ അവർക്ക് ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ നീതിനിർവാഹകസമിതി മെമ്പർ

സെക്രട്ടറി ആയ ഡോ. മാല രാമനാഥനെ ഫോണിൽ വിളിക്കാവുന്നതാണ് (0471-2524234).

നിങ്ങളുടെ രക്ഷിതാക്കൾക്ക് ഈ പഠനത്തെക്കുറിച്ച് അറിയാം. നിങ്ങൾക്ക് ഈ പഠനത്തിൽ പങ്കെടുക്കുന്നതിന് സമ്മതമാണെങ്കിൽ ദയവായി സമ്മതപത്രത്തിൽ നിങ്ങളുടെ പേര് എഴുതിയതിനു ശേഷം തിരികെ നൽകുക.

പഠനം നടത്തുന്ന ആളിൻറെ ഒപ്പ്: തീയതി:

Appendix 19i – Assent form for children - Baseline survey and clinical oral examination among children (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Baseline survey and clinical oral examination among children
Assent form for children

The participant information sheet had been read out to me. I understand that if I participates in this study, you will ask me some simple questions regarding my oral health related knowledge, attitude and practices; and you would also examine my mouth. I know that I can withdraw from this study at any time and it will not affect me in any way. By writing my name in this form I agree to participate in this study.

Name of the child:

Date:

Appendix 19ii – Assent form for children - Baseline survey and clinical oral examination among children (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

കുട്ടികളുടെ അടിസ്ഥാന വിലയിരുത്തലും വായുടെ പരിശോധനയും

കുട്ടികളുടെ സമ്മതപത്രം

പങ്കെടുക്കുന്നവർക്കായുള്ള വിവരണ പത്രിക എന്നെ വായിച്ചു കേൾപ്പിച്ചു. ഈ പഠനത്തിൽ ഞാൻ പങ്കെടുത്താൽ, നിങ്ങൾ എന്നോട് എൻറെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവുകളെയും നിലപാടുകളെയും ശീലങ്ങളെയും ബുദ്ധിമുട്ടുകളെയും കുറിച്ചുള്ള ചില ലളിതമായ ചോദ്യങ്ങൾ ചോദിക്കുമെന്നും നിങ്ങൾ എൻറെ വായ് പരിശോധിക്കുമെന്നും ഞാൻ മനസിലാക്കുന്നു. എനിക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ പഠനത്തിൽ നിന്നും പിന്മാറാവുന്നതാണെന്നും എന്നെ അത് ഒരു തരത്തിലും ബാധിക്കുകയില്ല എന്നും ഞാൻ മനസിലാക്കുന്നു. ഈ സമ്മതപത്രത്തിൽ പേര് എഴുതി ഈ പഠനത്തിൽ പങ്കെടുക്കാൻ ഞാൻ എന്റെ സമ്മതം അറിയിക്കുന്നു.

കുട്ടിയുടെ പേര്:

തിയതി:

Appendix 20i – Participant information sheet for parents - In depth interviews with parents of 6-12 year old school children showing extremes of oral hygiene status in the baseline survey (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

In depth interviews with parents of 6-12 year old school children showing extremes of oral hygiene status in the baseline survey

Participant information sheet

I am Neethu Suresh, PhD Scholar from the Achutha Menon Centre for Health Sciences Studies in Sree Chitra Tirunal Institute for Medical Sciences and Technology. I am conducting a study titled "Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial" as part of my PhD program. As part of the study I have examined your child's mouth and I have asked a few questions to your child regarding his/her oral health related behaviour. I have approached you for this interview because I wanted to know more regarding the oral health related behaviour of your child and how you take care of your child's oral health.

If you permit to record the interview, that would be convenient for me to save the time and to ensure all important points from you are duly noted. The recording of your interview will be kept under safe custody and transcribed without revealing your identity, but only an identifying code. Both the recording and the transcription of your interview will be used for research purposes only. You are free to quit this interview at any point of time. If you have any doubt regarding the study please feel free to contact me in the address given below. If you are willing to be interviewed please sign the consent form.
Thank you.

Neethu Suresh (PhD Scholar)
Achutha Menon Centre for Health Sciences Studies
Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum
Phone number: 9895471757

Appendix 20ii – Participant information sheet for parents - In depth interviews with parents of 6-12 year old school children showing extremes of oral hygiene status in the baseline survey (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

അടിസ്ഥാന പരിശോധനയിൽ വായുടെ ശുചിത്വ സ്ഥിതി ഏറ്റവും നല്ലതും ഏറ്റവും മോശമായും കാണപ്പെടുന്ന 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികളുടെ രക്ഷിതാക്കളുമായി നടത്തുന്ന ആഴത്തിലുള്ള അഭിമുഖസംഭാഷണം

പങ്കെടുക്കുന്നവർക്കുള്ള വിവരണ പത്രിക

ഞാൻ നീതു സുരേഷ്. ഞാൻ ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ ഭാഗമായ അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസിലെ ഗവേഷണ വിദ്യാർത്ഥിനിയാണ്. ഗവേഷണത്തിൻറെ ഭാഗമായി ഞാൻ തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ഒരു ശാസ്ത്രീയ പഠനം നടത്തുകയാണ്. അതിൻറെ ഭാഗായമായി ഞാൻ താങ്കളുടെ കുട്ടിയുടെ വായ് പരിശോധിക്കുകയും വായുടെ ആരോഗ്യവുമായി ബന്ധന്ധപ്പെട്ട ശീലങ്ങളെക്കുറിച്ച് താങ്കളുടെ കുട്ടിയോട് ചില ചോദ്യങ്ങൾ ചോദിക്കുകയും ചെയ്തിരുന്നു. താങ്കളുടെ കുട്ടിയുടെ വായുടെ ആരോഗ്യവുമായി ബന്ധന്ധപ്പെട്ട ശീലങ്ങളെക്കുറിച്ച് കൂടുതൽ മനസ്സിലാക്കാനും താങ്കൾ അങ്ങനെയാണ് താങ്കളുടെ കുട്ടിയുടെ വായുടെ ആരോഗ്യം സംരക്ഷിക്കുന്നതെന്ന് അറിയാനുമാണ് ഞാൻ ഈ അഭിമുഖം നടത്തുന്നത്.

ഈ അഭിമുഖം റെക്കോർഡ് ചെയ്യാൻ താങ്കൾ അനുവദിച്ചാൽ അത് സമയം ലാഭിക്കാൻ എന്നെ സഹായിക്കും മാത്രമല്ല താങ്കൾ പറയുന്ന എല്ലാ പ്രധാനപ്പെട്ട കാര്യങ്ങളും വിട്ടുപോകാതെ രേഖപ്പെടുത്താൻ എനിക്ക് സാധിക്കും. അഭിമുഖത്തിൻറെ റെക്കോർഡിങ് സുരക്ഷിതമായി സൂക്ഷിക്കപെടും. താങ്കൾ ആരാണെന്നു വെളിപ്പെടുത്താതെ ഒരു കോഡ് നൽകിയായിരിക്കും അഭിമുഖം പകർത്തി എഴുതുക. അഭിമുഖത്തിൻറെ റെക്കോർഡിങ്ങും പകർപ്പെഴുത്തും ഗവേഷണാവശ്യത്തിനായി മാത്രമേ ഉപയോഗിക്കുകയുള്ളു. താങ്കൾക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ അഭിമുഖത്തിൽ നിന്നും പിന്മാറാവുന്നതാണ്. ഈ പഠനത്തെക്കുറിച്ച് താങ്കൾക്ക് എന്തെങ്കിലും സംശയമുണ്ടെങ്കിൽ താഴെ കൊടുത്തിരിക്കുന്ന മേൽവിലാസത്തിൽ എന്നെ ബന്ധപ്പെടാം. ഈ അഭിമുഖത്തിൽ പങ്കെടുക്കാൻ താങ്കൾക്ക് സമ്മതമാണെങ്കിൽ ദയവായി സമ്മതപത്രത്തിൽ ഒപ്പ് വെയ്ക്കുക.

നന്ദി.

നീതു സുരേഷ് (ഗവേഷണ വിദ്യാർത്ഥിനി)
അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസ്
ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജി, ട്രിവാൻഡ്രം. ഫോൺ നമ്പർ: 98954717

Appendix 21i – Consent form for parents - In depth interviews with parents of 6-12 year old school children showing extremes of oral hygiene status in the baseline survey (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

In depth interviews with parents of 6-12 year old school children showing extremes of oral hygiene status in the baseline survey

Informed consent

I have read/ been read out the information in participant information sheet. I understand that I have been approached by you for this interview because you wanted to know more regarding the oral health related behaviour of my child and how I take care of my child's oral health. I also understand that you wish to record the interview and that any information collected from me will be used for the study purpose only. I know that I can withdraw from the interview at any time. By signing this consent form I voluntarily agree to take part in this interview.

Participant's name:

Participant's signature/ Thumb impression:

Date:

Interviewer's name:

Interviewer's signature:

Date:

Appendix 21ii – Consent form for parents - In depth interviews with parents of 6-12 year old school children showing extremes of oral hygiene status in the baseline survey (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

അടിസ്ഥാന പരിശോധനയിൽ വായുടെ ശുചിത്വ സ്ഥിതി ഏറ്റവും നല്ലതും ഏറ്റവും മോശമായും കാണപ്പെടുന്ന 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികളുടെ രക്ഷിതാക്കളുമായി നടത്തുന്ന ആഴത്തിലുള്ള അഭിമുഖസംഭാഷണം

സമ്മതപത്രം

പങ്കെടുക്കുന്നവർക്കായുള്ള വിവരണ പത്രിക ഞാൻ വായിച്ചു / എന്നെ വായിച്ചു കേൾപ്പിച്ചു. എൻറെ കുട്ടിയുടെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട ശീലങ്ങളെക്കുറിച്ച് കൂടുതൽ മനസ്സിലാക്കാനും ഞാൻ അങ്ങനെയാണ് എൻറെ കുട്ടിയുടെ വായുടെ ആരോഗ്യം സംരക്ഷിക്കുന്നതെന്ന് അറിയാനുമാണ് താങ്കൾ ഈ അഭിമുഖം നടത്തുന്നത് എന്ന് ഞാൻ മനസിലാക്കുന്നു. താങ്കൾ ഈ അഭിമഖം റെക്കോർഡ് ചെയ്യാൻ ആഗ്രഹിക്കുന്നു എന്നും എൻറെ പക്കൽ നിന്നും ശേഖരിക്കുന്ന വിവരങ്ങൾ പഠനാവശ്യത്തിനായി മാത്രമേ ഉപയോഗിക്കുകയുള്ളു എന്നും ഞാൻ മനസിലാക്കുന്നു. എനിക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ അഭിമുഖത്തിൽ നിന്നും പിന്മാറാം എന്ന് എനിക്ക് അറിയാം. ഈ സമ്മതപത്രം ഒപ്പ് വയ്ക്കുന്നത് വഴി ഈ അഭിമുഖത്തിൽ പങ്കെടുക്കാൻ ഞാൻ സ്വമേധയാ സമ്മതിക്കുന്നു.

പങ്കെടുക്കുന്ന ആളിൻറെ പേര്:

പങ്കെടുക്കുന്ന ആളിൻറെ ഒപ്പ് / വിരലടയാളം: തീയതി:

അഭിമുഖം നടത്തുന്ന ആളിൻറെ പേര്:

അഭിമുഖം നടത്തുന്ന ആളിൻറെ ഒപ്പ്: തീയതി:

Appendix 22i – Participant information sheet for parents – Oral health education intervention, post intervention survey and clinical oral examination (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Oral health education intervention, post intervention survey and clinical oral examination
Participant information sheet for parents

I am Dr. Neethu Suresh, PhD Scholar from the Achutha Menon Centre for Health Sciences Studies in Sree Chitra Tirunal Institute for Medical Sciences and Technology. I am conducting a study titled "Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial" as part of my PhD program. As part of the study I am planning to conduct oral health education classes for the children, and to find the effect of those oral health education classes on oral health related knowledge, attitude and practices of children and their oral health status.

I am inviting your child to participate in this study. If you agree to let your child participate in this study, they will receive the oral health education classes. After the classes I will ask your child some simple questions regarding his/her oral health related knowledge, attitude and practices. I would also like to examine your child's mouth.

Your child's participation in this study is entirely voluntary after giving his/ her assent. You or your child can quit from this study at any time. It will not affect you or your child in any way.

There is no risk to your child if he/she participates in the study. Some children may experience mild discomfort while oral examination.

The benefit of participating in this study is that your child will receive oral health education class.

Your child's personal information will not be revealed in any publication or reports related to the study. Only people associated with the study will have access to the personal information of the child.

If you have any doubt regarding the study please feel free to contact me directly (Phone number: 9895471757). In case you wish to seek any clarification regarding this study, you can contact the member-secretary of the Institute Ethics Committee of Sree Chitra Tirunal Institute for Medical Sciences and Technology (Dr Mala Ramanathan, phone number: 0471-2524234).

If you are willing to let your child take part in the study, please sign the consent form and return it with the child as early as possible.

Signature of the researcher: Date:

Appendix 22ii – Participant information sheet for parents – Oral health education intervention, post intervention survey and clinical oral examination (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ നടപ്പിലാക്കൽ, അതിനുശേഷമുള്ള വിലയിരുത്തലും വായുടെ പരിശോധനയും

രക്ഷിതാക്കൾക്കുള്ള വിവരണ പത്രിക

ഞാൻ ഡോക്ടർ നീതു സുരേഷ്. ഞാൻ ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ ഭാഗമായ അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസിലെ ഗവേഷണ വിദ്യാർത്ഥിനിയാണ്. ഗവേഷണത്തിൻറെ ഭാഗമായി ഞാൻ തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ഒരു ശാസ്ത്രീയ പഠനം നടത്തുകയാണ്. പഠനത്തിന്റെ ഭാഗമായി കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ നടത്താൻ ഞാൻ ആലോചിക്കുന്നു. അതിനുശേഷം വായുടെ ആരോഗ്യത്തെ സംബന്ധിച്ച് കുട്ടികളുടെ അറിവിലും നിലപാടുക ളിലും ശീലങ്ങളിലും മാറ്റമുണ്ടായോ എന്നും അവരുടെ വായുടെ ആരോഗ്യ സ്ഥിതിലും മാറ്റമുണ്ടായോ എന്നും അറിയണം.

ഈ പഠനത്തിൻറെ ഭാഗമാകാൻ ഞാൻ താങ്കളുടെ കുട്ടിയെ ക്ഷണിക്കുകയാണ്. ഈ പഠനത്തിൽ പങ്കെടുക്കാൻ താങ്കൾ താങ്കളുടെ കുട്ടിയെ അനുവദിച്ചാൽ, താങ്കളുടെ കുട്ടിക്ക് വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ് ലഭിക്കും. അതിനുശേഷം ഞാൻ താങ്കളുടെ കുട്ടിയോട് അവരുടെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവുകളെയും നിലപാടുകളെയും ശീലങ്ങളെയും ബുദ്ധിമുട്ടുകളെയും കുറിച്ചുള്ള ചില ലളിതമായ ചോദ്യങ്ങൾ ചോദിക്കും. താങ്കളുടെ കുട്ടിയുടെ വായ് പരിശോധിക്കാനും ഞാൻ ആഗ്രഹിക്കുന്നു.

ഈ പഠനത്തിനുള്ള താങ്കളുടെ കുട്ടിയുടെ പങ്കാളിത്തം അവരുടെ സമ്മതത്തോടുകൂടി തികച്ചും സ്വമേധയ ആയിരിക്കും. തങ്ങൾക്കോ താങ്കളുടെ കുട്ടിക്കോ എപ്പോൾ വേണമെങ്കിലും ഈ പഠനത്തിൽ നിന്നും പിന്മാറാവുന്നതാണ്. താങ്കളെയോ താങ്കളുടെ കുട്ടിയെയോ അത് ഒരു തരത്തിലും ബാധിക്കുകയില്ല.

ഈ പഠനത്തിൽ പങ്കെടുത്തതുകൊണ്ട് താങ്കളുടെ കുട്ടിക്ക് ഒരു ബുദ്ധിമുട്ടും ഉണ്ടാകില്ല. വായ് പരിശോധിക്കുമ്പോൾ ചില കുട്ടികൾക്ക് ചെറിയ പ്രയാസം തോന്നിയേക്കാം.

താങ്കളുടെ കുട്ടിക്ക് വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ് ലഭിക്കും എന്നതാണ് ഈ പഠനത്തിൽ പങ്കടുക്കുന്നതിൻറെ നേട്ടം.

ഈ പഠനവുമായി ബന്ധപ്പെട്ട പ്രസിദ്ധികരണങ്ങളിലോ റിപ്പോർട്ടുകളിലോ താങ്കളുടെ

കുട്ടിയുടെ വ്യക്തിപരമായ വിവരങ്ങൾ വെളിപ്പെടുത്തുകയില്ല. ഈ പഠനവുമായി ബന്ധപ്പെട്ട ആളുകൾക്ക് മാത്രമേ താങ്കളുടെ കുട്ടിയുടെ വ്യക്തിപരമായ വിവരങ്ങൾ ലഭ്യമാകുകയുള്ളു.

ഈ പഠനവുമായി ബന്ധപ്പെട്ട് താങ്കൾക്ക് എന്തെങ്കിലും സംശയങ്ങൾ ഉണ്ടെങ്കിൽ താങ്കൾക്ക് എന്നെ നേരിട്ട് വിളിക്കാവുന്നതാണ്. (ഫോൺ നമ്പർ: 9895471757). ഈ പഠനവുമായി ബന്ധപ്പെട്ട് താങ്കൾക്ക് എന്തെങ്കിലും വിശദികരണം ആവശ്യമാണെങ്കിൽ താങ്കൾക്ക് ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ നീതിനിർവാഹകസമിതി മെമ്പർ സെക്രട്ടറി ആയ ഡോ. മാല രാമനാഥനെ ഫോണിൽ വിളിക്കാവുന്നതാണ് (0471-2524234).

താങ്കളുടെ കുട്ടി ഈ പഠനത്തിൽ പങ്കെടുക്കുന്നത് താങ്കൾക്ക് സമ്മതമാണെങ്കിൽ ദയവായി സമ്മതപത്രത്തിൽ ഒപ്പ് വെച്ചതിനുശേഷം സമ്മതപത്രം തങ്ങളുടെ കുട്ടിയുടെ കൈവശം കൊടുത്തു വിടുക.

പഠനം നടത്തുന്ന ആളിൻറെ ഒപ്പ്: തീയതി:

Appendix 23i – Consent form for parents – Oral health education intervention, post intervention survey and clinical oral examination (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Oral health education intervention, post intervention survey and clinical oral examination
Consent form for parents

I have received a signed copy of the participant information sheet and I have read the information in it. I understand that if my child participates in this study, my child will receive oral health education class. I also understand that you will ask my child some simple questions regarding his/her oral health related knowledge, attitude and practices; and you would also examine my child's mouth. I know that my child or I can withdraw from this study at any time and it will not affect us in any way. I understand that my child's personal information will not be revealed in any publication or reports related to the study. By signing this consent form I voluntarily permit my child to take part in this study.

I, _____ father / mother / guardian of _____ voluntarily permit my child to take part in this study.

Date:

Appendix 23ii – Consent form for parents – Oral health education intervention, post intervention survey and clinical oral examination (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ നടപ്പിലാക്കൽ, അതിനുശേഷമുള്ള വിലയിരുത്തലും വായുടെ പരിശോധനയും

രക്ഷിതാക്കളുടെ സമ്മതപത്രം

പങ്കെടുക്കുന്നവർക്കായുള്ള ഒപ്പ് വെച്ച വിവരണ പത്രിക എനിക്ക് കിട്ടി, അതിലെ വിവരങ്ങൾ ഞാൻ വായിച്ചു. ഈ പഠനത്തിൽ പങ്കെടുക്കാൻ ഞാൻ എൻറെ കുട്ടിയെ അനുവദിച്ചാൽ, എൻറെ കുട്ടിക്ക് വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ് ലഭിക്കുമെന്ന് ഞാൻ മനസിലാക്കുന്നു. താങ്കൾ എൻറെ കുട്ടിയോട് അവരുടെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവുകളെയും നിലപാടുകളെയും ശീലങ്ങളെയും ബുദ്ധിമുട്ടുകളെയും കുറിച്ചുള്ള ചില ലളിതമായ ചോദ്യങ്ങൾ ചോദിക്കുമെന്നും താങ്കൾ എൻറെ കുട്ടിയുടെ വായ് പരിശോധിക്കുമെന്നും ഞാൻ മനസിലാക്കുന്നു. എനിക്കോ എൻറെ കുട്ടിക്കോ എപ്പോൾ വേണമെങ്കിലും ഈ പഠനത്തിൽ നിന്നും പിന്മാറാവുന്നതാണെന്നും എന്നെയോ എൻറെ കുട്ടിയെയോ അത് ഒരു തരത്തിലും ബാധിക്കുകയില്ല എന്നും ഞാൻ മനസിലാക്കുന്നു. ഈ പഠനവുമായി ബന്ധപ്പെട്ട പ്രസിദ്ധികരണങ്ങളിലോ റിപ്പോർട്ടുകളിലോ എൻറെ കുട്ടിയുടെ വ്യക്തിപരമായ വിവരങ്ങൾ വെളിപ്പെടുത്തുകയില്ല എന്ന് ഞാൻ മനസിലാക്കുന്നു. ഈ സമ്മതപത്രം ഒപ്പ് വയ്ക്കുന്നത് വഴി എൻറെ കുട്ടിയെ ഈ പഠനത്തിൽ പങ്കെടുപ്പിക്കാൻ ഞാൻ സ്വമേധയാ സമ്മതിക്കുന്നു.

എൻറെ പേര് _____ എന്നാണ്.

ഞാൻ _____ എന്ന കുട്ടിയുടെ അച്ഛൻ / അമ്മ / രക്ഷിതാവ് ആണ്. എൻറെ കുട്ടിയെ ഈ പഠനത്തിൽ പങ്കെടുപ്പിക്കാൻ ഞാൻ സ്വമേധയാ സമ്മതിക്കുന്നു.

തീയതി:

Appendix 24i – Participant information sheet for children – Oral health education intervention, post intervention survey and clinical oral examination (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Oral health education intervention, post intervention survey and clinical oral examination
Participant information sheet for children

I am Dr. Neethu Suresh, PhD Scholar from the Achutha Menon Centre for Health Sciences Studies in Sree Chitra Tirunal Institute for Medical Sciences and Technology. I am conducting a study titled "Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial" as part of my PhD program. As part of the study I am planning to conduct oral health education classes for the children, and to find the effect of those oral health education classes on oral health related knowledge, attitude and practices of children and their oral health status.

I am inviting you to participate in this study. If you agree to participate in this study, you will receive the oral health education classes. After the classes I will ask you some simple questions regarding your oral health related knowledge, attitude and practices. I would also like to examine your mouth.

Your participation in this study is entirely voluntary after giving your assent. You can quit from this study at any time. It will not affect your study in any way.

There is no risk to you if you participate in the study. Some children may experience mild discomfort while oral examination.

The benefit of participating in this study is that you will receive oral health education class.

Your personal information will not be revealed in any publication or reports related to the study. Only people associated with the study will have access to your personal information.

If you have any doubt regarding the study please feel free to tell your parents or teachers to contact me directly (Phone number: 9895471757). In case your parents or teachers wish to seek any clarification regarding this study, they can contact the member- secretary of the Institute Ethics Committee of Sree Chitra Tirunal Institute for Medical Sciences and Technology (Dr Mala Ramanathan, phone number: 0471-2524234).

Your parents are aware of this study. If you are willing to take part in the study, please give your say so by writing your name in the assent form and return it.

Signature of the researcher: Date:

Appendix 24ii – Participant information sheet for children – Oral health education intervention, post intervention survey and clinical oral examination (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ നടപ്പിലാക്കൽ, അതിനുശേഷമുള്ള വിലയിരുത്തലും വായുടെ പരിശോധനയും

കുട്ടികൾക്കുള്ള വിവരണ പത്രിക

ഞാൻ ഡോക്ടർ നീതു സുരേഷ്. ഞാൻ ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ ഭാഗമായ അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസിലെ ഗവേഷണ വിദ്യാർത്ഥിനിയാണ്. ഗവേഷണത്തിൻറെ ഭാഗമായി ഞാൻ തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ഒരു ശാസ്ത്രീയ പഠനം നടത്തുകയാണ്. പഠനത്തിന്റെ ഭാഗമായി കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ നടത്താൻ ഞാൻ ആലോചിക്കുന്നു. അതിനുശേഷം വായുടെ ആരോഗ്യത്തെ സംബന്ധിച്ച് കുട്ടികളുടെ അറിവിലും നിലപാടുക ളിലും ശീലങ്ങളിലും മാറ്റമുണ്ടായോ എന്നും അവരുടെ വായുടെ ആരോഗ്യ സ്ഥിതിലും മാറ്റമുണ്ടായോ എന്നും അറിയണം.

ഈ പഠനത്തിൻറെ ഭാഗമാകാൻ ഞാൻ നിങ്ങളെ ക്ഷണിക്കുകയാണ്. ഈ പഠനത്തിൽ പങ്കെടുത്താൽ നിങ്ങൾക്ക് വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ് ലഭിക്കും. അതിനുശേഷം ഞാൻ നിങ്ങളോട് നിങ്ങളുടെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവുകളെയും നിലപാടുകളെയും ശീലങ്ങളെയും ബുദ്ധിമുട്ടുകളെയും കുറിച്ചുള്ള ചില ലളിതമായ ചോദ്യങ്ങൾ ചോദിക്കും. നിങ്ങളുടെ വായ് പരിശോധിക്കാനും ഞാൻ ആഗ്രഹിക്കുന്നു.

ഈ പഠനത്തിനുള്ള നിങ്ങളുടെ പങ്കാളിത്തം നിങ്ങളുടെ സമ്മതത്തോടുകൂടി തികച്ചും സ്വമേധയ ആയിരിക്കും. നിങ്ങൾക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ പഠനത്തിൽ നിന്നും പിന്മാറാവുന്നതാണ്. നിങ്ങളുടെ പഠനത്തെ അത് ഒരു തരത്തിലും ബാധിക്കുകയില്ല.

ഈ പഠനത്തിൽ പങ്കെടുത്തതുകൊണ്ട് നിങ്ങൾക്ക് ഒരു ബുദ്ധിമുട്ടും ഉണ്ടാകില്ല. വായ് പരിശോധിക്കുമ്പോൾ ചില കുട്ടികൾക്ക് ചെറിയ പ്രയാസം തോന്നിയേക്കാം.

നിങ്ങൾക്ക് വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ് ലഭിക്കും എന്നതാണ് ഈ പഠനത്തിൽ പങ്കടുക്കുന്നതിൻറെ നേട്ടം.

ഈ പഠനവുമായി ബന്ധപ്പെട്ട പ്രസിദ്ധികരണങ്ങളിലോ റിപ്പോർട്ടുകളിലോ നിങ്ങളുടെ വ്യക്തിപരമായ വിവരങ്ങൾ വെളിപ്പെടുത്തുകയില്ല. ഈ പഠനവുമായി ബന്ധപ്പെട്ട ആളുകൾക്ക് മാത്രമേ നിങ്ങളുടെ വ്യക്തിപരമായ വിവരങ്ങൾ ലഭ്യമാകുകയുള്ളു.

ഈ പഠനവുമായി ബന്ധപ്പെട്ട് നിങ്ങൾക്ക് എന്തെങ്കിലും സംശയങ്ങൾ ഉണ്ടെങ്കിൽ നിങ്ങൾക്ക് നിങ്ങളുടെ രക്ഷിതാക്കളോടോ അധ്യാപകരോടോ എന്നെ നേരിട്ട് വിളിക്കാൻ പറയാവുന്നതാണ്. (ഫോൺ നമ്പർ: 9895471757). ഈ പഠനവുമായി ബന്ധപ്പെട്ട് നിങ്ങളുടെ രക്ഷിതാക്കൾക്കോ അധ്യാപകർക്കോ എന്തെങ്കിലും വിശദികരണം ആവശ്യമാണെങ്കിൽ അവർക്ക് ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ നീതിനിർവാഹകസമിതി മെമ്പർ സെക്രട്ടറി ആയ ഡോ. മാല രാമനാഥനെ ഫോണിൽ വിളിക്കാവുന്നതാണ് (0471-2524234).

നിങ്ങളുടെ രക്ഷിതാക്കൾക്ക് ഈ പഠനത്തെക്കുറിച്ച് അറിയാം. നിങ്ങൾക്ക് ഈ പഠനത്തിൽ പങ്കെടുക്കുന്നതിന് സമ്മതമാണെങ്കിൽ ദയവായി സമ്മതപത്രത്തിൽ നിങ്ങളുടെ പേര് എഴുതിയതിനു ശേഷം തിരികെ നൽകുക.

പഠനം നടത്തുന്ന ആളിൻറെ ഒപ്പ്: തീയതി:

Appendix 25i – Assent form for children – Oral health education intervention, post intervention survey and clinical oral examination (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Oral health education intervention, post intervention survey and clinical oral examination
Assent form for children

The participant information sheet had been read out to me. I understand that if I participates in this study, I will receive oral health education class you. I also understand that you will ask me some simple questions regarding my oral health related knowledge, attitude and practices; and you would also examine my mouth. I know that I can withdraw from this study at any time and it will not affect me in any way. By writing my name in this form I agree to participate in this study.

Name of the child:

Date:

Appendix 25ii – Assent form for children – Oral health education intervention, post intervention survey and clinical oral examination (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ നടപ്പിലാക്കൽ, അതിനുശേഷമുള്ള വിലയിരുത്തലും വായുടെ പരിശോധനയും

കുട്ടികളുടെ സമ്മതപത്രം

പങ്കെടുക്കുന്നവർക്കായുള്ള വിവരണ പത്രിക എന്നെ വായിച്ചു കേൾപ്പിച്ചു. ഈ പഠനത്തിൽ ഞാൻ പങ്കെടുത്താൽ, എനിക്ക് വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ് ലഭിക്കുമെന്ന് ഞാൻ മനസിലാക്കുന്നു. മാത്രമല്ല നിങ്ങൾ എന്നോട് എൻറെ വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവുകളെയും നിലപാടുകളെയും ശീലങ്ങളെയും ബുദ്ധിമുട്ടുകളെയും കുറിച്ചുള്ള ചില ലളിതമായ ചോദ്യങ്ങൾ ചോദിക്കുമെന്നും നിങ്ങൾ എൻറെ വായ് പരിശോധിക്കുമെന്നും ഞാൻ മനസിലാക്കുന്നു. എനിക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ പഠനത്തിൽ നിന്നും പിന്മാറാവുന്നതാണെന്നും എന്നെ അത് ഒരു തരത്തിലും ബാധിക്കുകയില്ല എന്നും ഞാൻ മനസിലാക്കുന്നു. ഈ സമ്മതപത്രത്തിൽ പേര് എഴുതി ഈ പഠനത്തിൽ പങ്കെടുക്കാൻ ഞാൻ എന്റെ സമ്മതം അറിയിക്കുന്നു.

കുട്ടിയുടെ പേര്:

തിയതി:

Appendix 26i – Participant information sheet for teachers - FGDs with teachers of children in the intervention group (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Focus group discussions (FGDs) with teachers of children who received oral health education classes

Participant information sheet

I am Neethu Suresh, PhD Scholar from the Achutha Menon Centre for Health Sciences Studies in Sree Chitra Tirunal Institute for Medical Sciences and Technology. I am conducting a study titled "Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial" as part of my PhD program. As part of the study I have conducted oral health education classes for 6-12 year old school children. This discussion would help me to understand whether the classes and the oral health education materials given were useful. Your suggestions would help me find out how to improve the oral health education intervention program.

If you permit to record this discussion that would be convenient for me to save the time and to ensure all important points from you are duly noted. The recording of this discussion will be kept under safe custody and transcribed without revealing your identity, but only an identifying code. Both the recording and the transcription of the discussion will be used for research purposes only. You are free to quit this discussion at any point of time. If you have any doubt regarding the study please feel free to contact me in the address given below. If you are willing to be a part of this discussion please sign the consent form.
Thank you.

Neethu Suresh (PhD Scholar)
Achutha Menon Centre for Health Sciences Studies
Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum
Phone number: 9895471757

Appendix 26ii – Participant information sheet for teachers - FGDs with teachers of children in the intervention group (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ്സുകൾ ലഭിച്ച കുട്ടികളുടെ അദ്ധ്യാപകരുമായി നടത്തുന്ന ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകൾ

പങ്കെടുക്കുന്നവർക്കുള്ള വിവരണ പത്രിക

ഞാൻ നീതു സുരേഷ്. ഞാൻ ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ ഭാഗമായ അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസിലെ ഗവേഷണ വിദ്യാർത്ഥിനിയാണ്. ഗവേഷണത്തിൻറെ ഭാഗമായി ഞാൻ തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ഒരു ശാസ്ത്രീയ പഠനം നടത്തുകയാണ്. പഠനത്തിൻറെ ഭാഗമായി 6-12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്കായി വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ നടത്തിയിരുന്നു. ക്ലാസ്സുകളുടെയും വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള വിവരങ്ങൾ അടങ്ങിയ ലേഖകളുടെയും പ്രയോജനം കണ്ടെത്താൻ ഈ ചർച്ച എന്നെ സഹായിക്കും. വായുടെ ആരോഗ്യത്തെക്കുറിച്ച് കുട്ടികൾക്ക് അറിവ് പകർന്നു കൊടുക്കുന്ന പ്രോഗ്രാമുകൾ എങ്ങനെ മെച്ചപ്പെടുത്താമെന്നു കണ്ടെത്താനും താങ്കളുടെ നിർദ്ദേശങ്ങൾ എന്നെ സഹായിക്കും.

ഈ ചർച്ച റെക്കോർഡ് ചെയ്യാൻ താങ്കൾ അനുവദിച്ചാൽ അത് സമയം ലാഭിക്കാൻ എന്നെ സഹായിക്കും മാത്രമല്ല താങ്കൾ പറയുന്ന എല്ലാ പ്രധാനപ്പെട്ട കാര്യങ്ങളും വിട്ടുപോകാതെ രേഖപ്പെടുത്താൻ എനിക്ക് സാധിക്കും. ഈ ചർച്ചയുടെ റെക്കോർഡിങ് സുരക്ഷിതമായി സൂക്ഷിക്കപെടും. താങ്കൾ ആരാണെന്നു വെളിപ്പെടുത്താതെ ഒരു കോഡ് നൽകിയായിരിക്കും ഈ ചർച്ച പകർത്തി എഴുതുക. ഈ ചർച്ചയുടെ റെക്കോർഡിങ്ങും പകർപ്പെഴുത്തും ഗവേഷണാവശ്യത്തിനായി മാത്രമേ ഉപയോഗിക്കുകയുള്ളു. താങ്കൾക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ ചർച്ചയിൽ നിന്നും പിന്മാറാവുന്നതാണ്. ഈ പഠനത്തെക്കുറിച്ച് താങ്കൾക്ക് എന്തെങ്കിലും സംശയമുണ്ടെങ്കിൽ താഴെ കൊടുത്തിരിക്കുന്ന മേൽവിലാസത്തിൽ എന്നെ ബന്ധപ്പെടാം. ഈ ചർച്ചയിൽ പങ്കെടുക്കാൻ താങ്കൾക്ക് സമ്മതമാണെങ്കിൽ ദയവായി സമ്മതപത്രത്തിൽ ഒപ്പ് വെയ്ക്കുക.

നന്ദി.

നീതു സുരേഷ് (ഗവേഷണ വിദ്യാർത്ഥിനി)
അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസ്
ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജി, ട്രിവാൻഡ്രം, ഫോൺ നമ്പർ: 9895471757.

Appendix 27i – Consent form for teachers - FGDs with teachers of children in the intervention group (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Focus group discussions (FGDs) with teachers of children who received oral health education classes

Informed consent

I have read/ been read out the information in participant information sheet. I know that you had conducted oral health education classes for 6-12 year old school children. I realize that this discussion would help you to understand whether the classes and the oral health education materials given were useful. I also realize that my suggestions would help you find out how to improve the oral health education intervention program. I also understand that you wish to record this discussion and that any information collected from me will be used for the study purpose only. I know that I can withdraw from this discussion at any time. By signing this consent form I voluntarily agree to take part in this discussion.

Participant's name:

Participant's signature:

Date:

Moderator's name:

Moderator's signature:

Date:

Appendix 27ii – Consent form for teachers - FGDs with teachers of children in the intervention group (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ്സുകൾ ലഭിച്ച കുട്ടികളുടെ അദ്ധ്യാപകരുമായി നടത്തുന്ന ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകൾ

സമ്മതപത്രം

പങ്കെടുക്കുന്നവർക്കായുള്ള വിവരണ പത്രിക ഞാൻ വായിച്ചു / എന്നെ വായിച്ചു കേൾപ്പിച്ചു. നിങ്ങൾ 6-12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്കായി വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ നടത്തിയതായി എനിക്ക് അറിയാം. ക്ലാസ്സുകളുടെയും വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള വിവരങ്ങൾ അടങ്ങിയ ലേഖകളുടെയും പ്രയോജനം കണ്ടെത്താൻ ഈ ചർച്ച താങ്കളെ എന്ന് ഞാൻ മനസിലാക്കുന്നു. വായുടെ ആരോഗ്യത്തെക്കുറിച്ച് കുട്ടികൾക്ക് അറിവ് പകർന്നു കൊടുക്കുന്ന പ്രോഗ്രാമുകൾ എങ്ങനെ മെച്ചപ്പെടുത്താമെന്നു കണ്ടെത്താനും എൻറെ നിർദ്ദേശങ്ങൾ താങ്കളെ സഹായിക്കും എന്ന് ഞാൻ മനസിലാക്കുന്നു. താങ്കൾ ഈ ചർച്ച റെക്കോർഡ് ചെയ്യാൻ ആഗ്രഹിക്കുന്നു എന്നും എൻറെ പക്കൽ നിന്നും ശേഖരിക്കുന്ന വിവരങ്ങൾ പഠനാവശ്യത്തിനായി മാത്രമേ ഉപയോഗിക്കുകയുള്ളു എന്നും ഞാൻ മനസിലാക്കുന്നു. എനിക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ ചർച്ചയിൽ നിന്നും പിന്മാറാം എന്ന് എനിക്ക് അറിയാം. ഈ സമ്മതപത്രം ഒപ്പ് വയ്ക്കുന്നത് വഴി ഈ ചർച്ചയിൽ പങ്കെടുക്കാൻ ഞാൻ സ്വമേധയാ സമ്മതിക്കുന്നു.

പങ്കെടുക്കുന്ന ആളിൻറെ പേര്:

പങ്കെടുക്കുന്ന ആളിൻറെ ഒപ്പ് / വിരലടയാളം: തീയതി:

ചർച്ച നയിക്കുന്ന ആളിൻറെ പേര്:

ചർച്ച നയിക്കുന്ന ആളിൻറെ ഒപ്പ്: തീയതി:

Appendix 28i – Participant information sheet for parents - FGDs with parents of children in the intervention group (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Focus group discussions (FGDs) with parents of children who received oral health education classes

Participant information sheet

I am Neethu Suresh, PhD Scholar from the Achutha Menon Centre for Health Sciences Studies in Sree Chitra Tirunal Institute for Medical Sciences and Technology. I am conducting a study titled "Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial" as part of my PhD program. As part of the study I have conducted oral health education classes for 6-12 year old school children. This discussion would help me to understand whether the classes and the oral health education materials given were useful. Your suggestions would help me find out how to improve the oral health education intervention program.

If you permit to record this discussion that would be convenient for me to save the time and to ensure all important points from you are duly noted. The recording of this discussion will be kept under safe custody and transcribed without revealing your identity, but only an identifying code. Both the recording and the transcription of the discussion will be used for research purposes only. You are free to quit this discussion at any point of time. If you have any doubt regarding the study please feel free to contact me in the address given below. If you are willing to be a part of this discussion please sign the consent form.
Thank you.

Neethu Suresh (PhD Scholar)
Achutha Menon Centre for Health Sciences Studies
Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum
Phone number: 9895471757

Appendix 28ii – Participant information sheet for parents - FGDs with parents of children in the intervention group (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ്സുകൾ ലഭിച്ച കുട്ടികളുടെ രക്ഷിതാക്കളുമായി നടത്തുന്ന ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകൾ

പങ്കെടുക്കുന്നവർക്കുള്ള വിവരണ പത്രിക

ഞാൻ നീതു സുരേഷ്. ഞാൻ ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജിയുടെ ഭാഗമായ അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസിലെ ഗവേഷണ വിദ്യാർത്ഥിനിയാണ്. ഗവേഷണത്തിൻറെ ഭാഗമായി ഞാൻ തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ഒരു ശാസ്ത്രീയ പഠനം നടത്തുകയാണ്. പഠനത്തിൻറെ ഭാഗമായി 6-12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്കായി വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ നടത്തിയിരുന്നു. ക്ലാസ്സുകളുടെയും വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള വിവരങ്ങൾ അടങ്ങിയ ലേഖകളുടെയും പ്രയോജനം കണ്ടെത്താൻ ഈ ചർച്ച എന്നെ സഹായിക്കും. വായുടെ ആരോഗ്യത്തെക്കുറിച്ച് കുട്ടികൾക്ക് അറിവ് പകർന്നു കൊടുക്കുന്ന പ്രോഗ്രാമുകൾ എങ്ങനെ മെച്ചപ്പെടുത്താമെന്നു കണ്ടെത്താനും താങ്കളുടെ നിർദ്ദേശങ്ങൾ എന്നെ സഹായിക്കും.

ഈ ചർച്ച റെക്കോർഡ് ചെയ്യാൻ താങ്കൾ അനുവദിച്ചാൽ അത് സമയം ലാഭിക്കാൻ എന്നെ സഹായിക്കും മാത്രമല്ല താങ്കൾ പറയുന്ന എല്ലാ പ്രധാനപ്പെട്ട കാര്യങ്ങളും വിട്ടുപോകാതെ രേഖപ്പെടുത്താൻ എനിക്ക് സാധിക്കും. ഈ ചർച്ചയുടെ റെക്കോർഡിങ് സുരക്ഷിതമായി സൂക്ഷിക്കപെടും. താങ്കൾ ആരാണെന്നു വെളിപ്പെടുത്താതെ ഒരു കോഡ് നൽകിയായിരിക്കും ഈ ചർച്ച പകർത്തി എഴുതുക. ഈ ചർച്ചയുടെ റെക്കോർഡിങ്ങും പകർപ്പെഴുത്തും ഗവേഷണാവശ്യത്തിനായി മാത്രമേ ഉപയോഗിക്കുകയുള്ളു. താങ്കൾക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ ചർച്ചയിൽ നിന്നും പിന്മാറാവുന്നതാണ്. ഈ പഠനത്തെക്കുറിച്ച് താങ്കൾക്ക് എന്തെങ്കിലും സംശയമുണ്ടെങ്കിൽ താഴെ കൊടുത്തിരിക്കുന്ന മേൽവിലാസത്തിൽ എന്നെ ബന്ധപ്പെടാം. ഈ ചർച്ചയിൽ പങ്കെടുക്കാൻ താങ്കൾക്ക് സമ്മതമാണെങ്കിൽ ദയവായി സമ്മതപത്രത്തിൽ ഒപ്പ് വെയ്ക്കുക.

നന്ദി.

നീതു സുരേഷ് (ഗവേഷണ വിദ്യാർത്ഥിനി)
അച്ചുത മേനോൻ സെൻറർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസ്
ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ്സ് ആൻഡ് ടെക്നോളജി, ട്രിവാൻഡ്രം, ഫോൺ നമ്പർ: 989547175.

Appendix 29i – Consent form for parents - FGDs with parents of children in the intervention group (English version)

Effectiveness of a school oral health education intervention among 6-12 year old children in Thiruvananthapuram educational district: a cluster randomized controlled trial

Focus group discussions (FGDs) with parents of children who received oral health education classes

Informed consent

I have read/ been read out the information in participant information sheet. I know that you had conducted oral health education classes for 6-12 year old school children. I realize that this discussion would help you to understand whether the classes and the oral health education materials given were useful. I also realize that my suggestions would help you find out how to improve the oral health education intervention program. I also understand that you wish to record this discussion and that any information collected from me will be used for the study purpose only. I know that I can withdraw from this discussion at any time. By signing this consent form I voluntarily agree to take part in this discussion.

Participant's name:

Participant's signature:

Date:

Moderator's name:

Moderator's signature:

Date:

Appendix 29ii – Consent form for parents - FGDs with parents of children in the intervention group (Malayalam version)

തിരുവന്തപുരം വിദ്യാഭ്യാസ ജില്ലയിലെ 6 - 12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്ക് വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു നൽകുന്ന പരിപാടിയുടെ പ്രയോജനം കണ്ടെത്താനുള്ള ശാസ്ത്രീയ പഠനം

വായുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട അറിവ് പകർന്നു നൽകുന്ന ക്ലാസ്സുകൾ ലഭിച്ച കുട്ടികളുടെ രക്ഷിതാക്കളുമായി നടത്തുന്ന ഫോക്കസ് ഗ്രൂപ്പ് ചർച്ചകൾ

സമ്മതപത്രം

പങ്കെടുക്കുന്നവർക്കായുള്ള വിവരണ പത്രിക ഞാൻ വായിച്ചു / എന്നെ വായിച്ചു കേൾപ്പിച്ചു. നിങ്ങൾ 6-12 വയസ്സുള്ള സ്കൂൾ കുട്ടികൾക്കായി വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള അറിവ് പകർന്നു കൊടുക്കുന്ന ക്ലാസുകൾ നടത്തിയതായി എനിക്ക് അറിയാം. ക്ലാസ്സുകളുടെയും വായുടെ ആരോഗ്യത്തെക്കുറിച്ചുള്ള വിവരങ്ങൾ അടങ്ങിയ ലേഖകളുടെയും പ്രയോജനം കണ്ടെത്താൻ ഈ ചർച്ച താങ്കളെ എന്ന് ഞാൻ മനസിലാക്കുന്നു. വായുടെ ആരോഗ്യത്തെക്കുറിച്ച് കുട്ടികൾക്ക് അറിവ് പകർന്നു കൊടുക്കുന്ന പ്രോഗ്രാമുകൾ എങ്ങനെ മെച്ചപ്പെടുത്താമെന്നു കണ്ടെത്താനും എൻറെ നിർദ്ദേശങ്ങൾ താങ്കളെ സഹായിക്കും എന്ന് ഞാൻ മനസിലാക്കുന്നു. താങ്കൾ ഈ ചർച്ച റെക്കോർഡ് ചെയ്യാൻ ആഗ്രഹിക്കുന്നു എന്നും എൻറെ പക്കൽ നിന്നും ശേഖരിക്കുന്ന വിവരങ്ങൾ പഠനാവശ്യത്തിനായി മാത്രമേ ഉപയോഗിക്കുകയുള്ളു എന്നും ഞാൻ മനസിലാക്കുന്നു. എനിക്ക് എപ്പോൾ വേണമെങ്കിലും ഈ ചർച്ചയിൽ നിന്നും പിന്മാറാം എന്ന് എനിക്ക് അറിയാം. ഈ സമ്മതപത്രം ഒപ്പ് വയ്ക്കുന്നത് വഴി ഈ ചർച്ചയിൽ പങ്കെടുക്കാൻ ഞാൻ സ്വമേധയാ സമ്മതിക്കുന്നു.

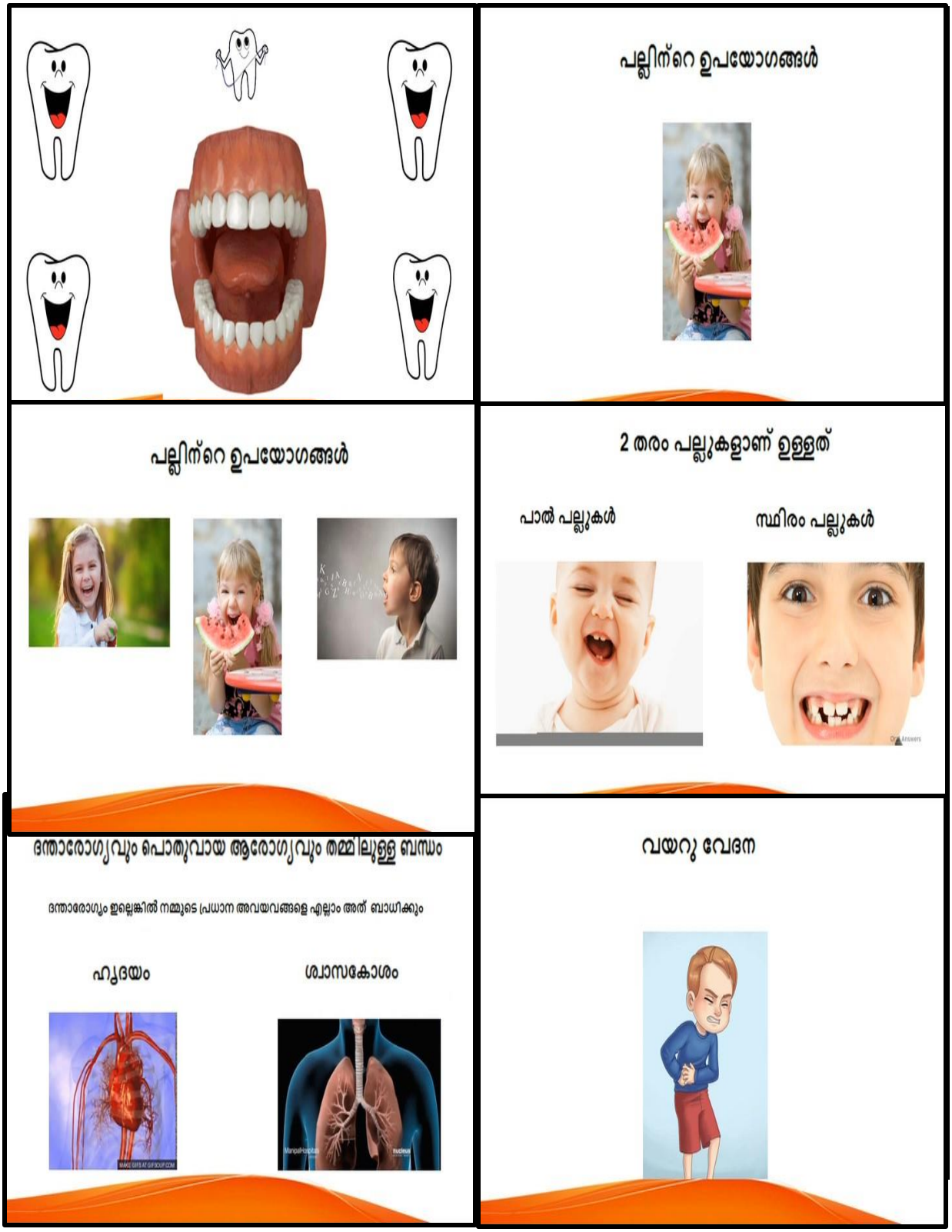
പങ്കെടുക്കുന്ന ആളിൻറെ പേര്:

പങ്കെടുക്കുന്ന ആളിൻറെ ഒപ്പ് / വിരലടയാളം: തീയതി:

ചർച്ച നയിക്കുന്ന ആളിൻറെ പേര്:

ചർച്ച നയിക്കുന്ന ആളിൻറെ ഒപ്പ്: തീയതി:

Appendix 30 – Oral health education video - Slides



പല്ലിനെ നന്നായി സംരക്ഷിക്കുക

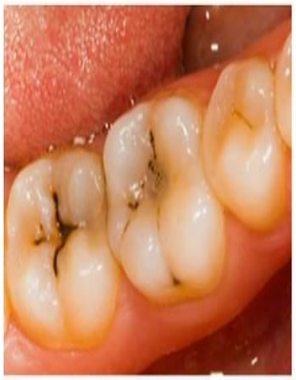
ദന്താരോഗ്യത്തിന് ആവശ്യമായ ആഹാരങ്ങൾ

ദന്താരോഗ്യത്തിന് ഹാനീകരമായ ആഹാരങ്ങൾ

മധുര പദാർത്ഥങ്ങൾ പല്ലിനു കേടുവരുത്തുന്നു

ആഹാരവസ്തുക്കൾ വായിൽ ഇരുന്നാൽ പല്ലിനെ കീടാണുക്കൾ ആക്രമിക്കും

പല്ലിൽ കീടാണുക്കൾ പോടുണ്ടാക്കുന്നു



പല്ലിൽ പോടു വന്നാൽ വേദന, നീര്, പല്ലു പൊഴിച്ചിൽ എന്നിവ ഉണ്ടാകുന്നു

മോണരോഗം വന്നാൽ

പല്ലു വേദന വന്നാലും മോണരോഗം വന്നാലും
ദന്ത ഡോക്ടറെ കാണുക

പല്ലു വേദന വന്നാലോ മോണയിൽ നിന്ന് രക്തം വന്നാലോ
Vicks , Clove Oil , Pain Out എന്നിവ ഉപയോഗിക്കരുത്

ദന്ത ഡോക്ടറെ കാണാതെ Pain Killer ഉപയോഗിക്കരുത്

ദന്താരോഗ്യത്തിനായി പഴങ്ങളും പച്ചക്കറികളും
കഴിക്കുക, തിളപ്പിച്ചാറ്റിയ വെള്ളം കുടിക്കുക

ദന്താരോഗ്യത്തിനായി ദിവസവും രണ്ടു തവണ
ബ്രഷ് ചെയ്യണം

ടൂത് പേസ്റ്റ് ഉപയോഗിച്ച് ബ്രഷ് ചെയ്യുക
പയറു വലുപ്പത്തിൽ മാത്രം പേസ്റ്റ് എടുക്കുക

മോണരോഗം വന്നാൽ

പല്ലു വേദന വന്നാലും മോണരോഗം വന്നാലും
ദന്ത ഡോക്ടറെ കാണുക

പല്ലു വേദന വന്നാലോ മോണയിൽ നിന്ന് രക്തം വന്നാലോ
Vicks , Clove Oil , Pain Out എന്നിവ ഉപയോഗിക്കരുത്

ദന്ത ഡോക്ടറെ കാണാതെ Pain Killer ഉപയോഗിക്കരുത്

ദന്താരോഗ്യത്തിനായി പഴങ്ങളും പച്ചക്കറികളും
കഴിക്കുക, തിളപ്പിച്ചാറ്റിയ വെള്ളം കുടിക്കുക

ദന്താരോഗ്യത്തിനായി ദിവസവും രണ്ടു തവണ
ബ്രഷ് ചെയ്യണം

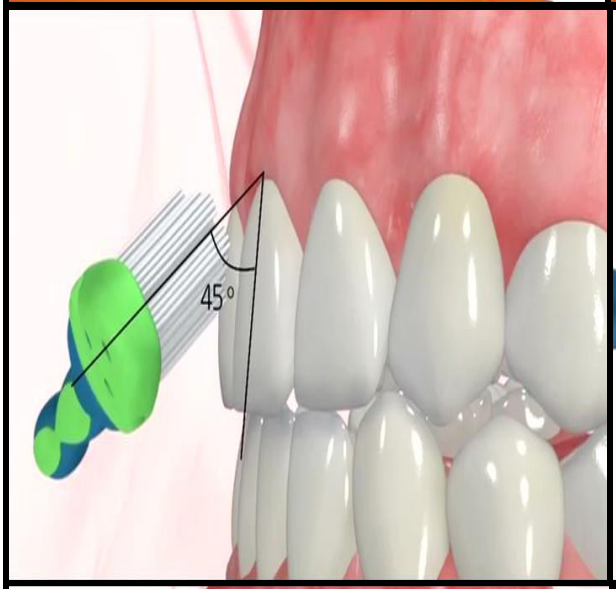
ടൂത് പേസ്റ്റ് ഉപയോഗിച്ച് ബ്രഷ് ചെയ്യുക
പയറു വലുപ്പത്തിൽ മാത്രം പേസ്റ്റ് എടുക്കുക

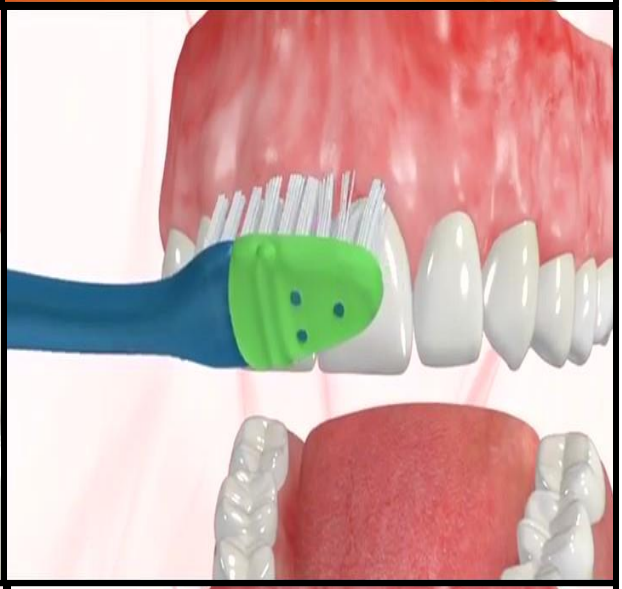
പല്ലു തേക്കുന്ന രീതി

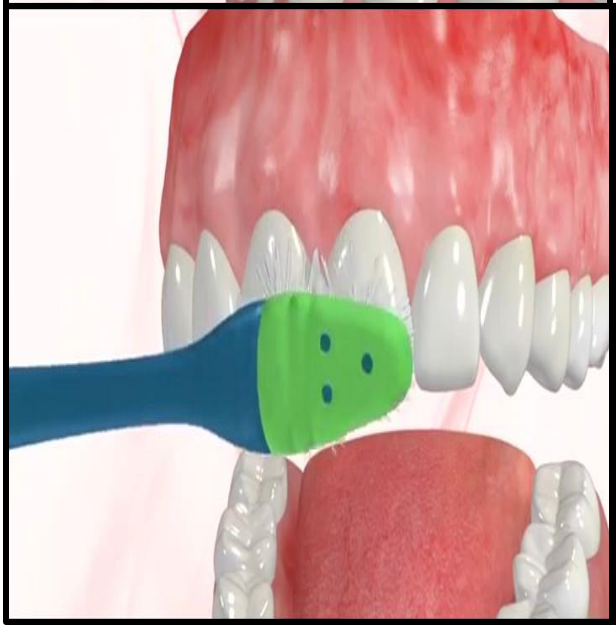
Modified Bass

പല്ലു തേക്കുന്ന രീതി

Modified Bass







നാക്ക് വൃത്തിയാക്കുന്ന രീതി

പല്ലു വൃത്തിയാക്കാൻ ഇവയൊന്നും ഉപയോഗിക്കരുത്

മൂന്നു മാസത്തിലൊരിക്കൽ ടൂത് ബ്രഷ് മാറ്റുക

ഭക്ഷണത്തിനു ശേഷം വായ് വൃത്തിയായി കഴുകുക
അല്ലെങ്കിൽ വെള്ളം കുടിക്കുക

ഇനി പറയുന്ന ആഹാര സാധനങ്ങൾ പൂർണമായും ഉപേക്ഷിക്കുക

ഇത് നിങ്ങളുടെ പല്ലിനെയും അതോടൊപ്പം നിങ്ങളുടെ
ആരോഗ്യത്തെയും ദോഷമായി ബാധിക്കും

ഇവയൊന്നും ഉപയോഗിക്കരുത്

ദന്താരോഗ്യത്തിനായി 6 മാസം കൂടുമ്പോൾ ദന്ത ഡോക്ടറെ കാണുക

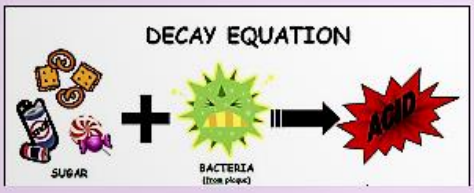
Appendix 31 – The tooth brushing model and the tooth brush

Appendix 32i – Chart 1

കുട്ടികളും ദന്താരോഗ്യവും -- ശ്രദ്ധിക്കേണ്ട കാര്യങ്ങൾ 1

- ഭക്ഷണം ചവക്കാനും, ചിരിക്കാനും, സംസാരിക്കാനും നമുക്ക് പല്ലുകൾ ആവശ്യമാണ്.
- നമുക്ക് 2 തരം പല്ലുകളാണ് ഉള്ളത്. പാൽ പല്ലുകളും, സ്ഥിരം പല്ലുകളും.
- പാൽ പല്ലുകളും സ്ഥിരം പല്ലുകളും സംരക്ഷിക്കേണ്ടത് വളരെ അത്യാവശ്യമാണ്.
- പാൽ പല്ലുകൾ കൊഴിഞ്ഞു പോയിട്ട് വരുന്നതാണ് സ്ഥിരം പല്ലുകൾ.
- പാൽ പല്ലുകൾക്ക് കേടു വന്നാൽ അത് സ്ഥിരം പല്ലുകളെയും ബാധിക്കും.
- പാൽ പല്ലുകൾ സമയത്തിന് മുൻപേ പൊഴിഞ്ഞു പോകുകയാണെങ്കിൽ സ്ഥിരം പല്ലുകൾ വരാൻ സ്ഥലമില്ലാതെയാകും.
- ദന്താരോഗ്യം ഇല്ലെങ്കിൽ നമ്മുടെ പ്രധാന അവയവങ്ങളെ എല്ലാം അത് ബാധിക്കും. ഹൃദയം, ശ്വാസകോശം, വയറു എന്നിവയെയാണ് പ്രധാനമായും അത് ബാധിക്കുന്നതു.
- പല്ലിനെ നന്നായി സംരക്ഷിക്കുക.
- ദന്താരോഗ്യത്തിനായി പഴങ്ങളും പച്ചക്കറികളും കഴിക്കുക, തിളപ്പിച്ചാറ്റിയ വെള്ളം കുടിക്കുക.
- ചോക്ലേറ്റുകളും മധുര പലഹാരങ്ങളും പല്ലിനു കേടു വരുത്തുന്നു

- ആഹാര വസ്തുക്കൾ വായിൽ ഇരുന്നാൽ പല്ലിനെ കീടാണുക്കൾ ആക്രമിക്കും.
- പല്ലിൽ കീടാണുക്കൾ പോടുണ്ടാക്കുന്നു.
- പല്ലിൽ പോടു വന്നാൽ വേദന, നീര് പല്ലു പൊഴിച്ചിൽ എന്നിവ ഉണ്ടാകുന്നു.



- പല്ലിൽ അഴുക്കിരുന്നാൽ മോണരോഗം വരും. മോണ രോഗം വന്നാൽ മോണയിൽ നിന്ന് രക്തം വരും. പൊഴിഞ്ഞു പോകാനുള്ള സാധ്യതയും ഉണ്ട്.

Dr. Neethu Suresh MDS, PhD Scholar,
Sree chitra Tirunal Institute for Medical Sciences & Technology, Trivandrum

Appendix 32ii – Chart 2

കുട്ടികളും ദന്താരോഗ്യവും -- ശ്രദ്ധിക്കേണ്ട കാര്യങ്ങൾ 2

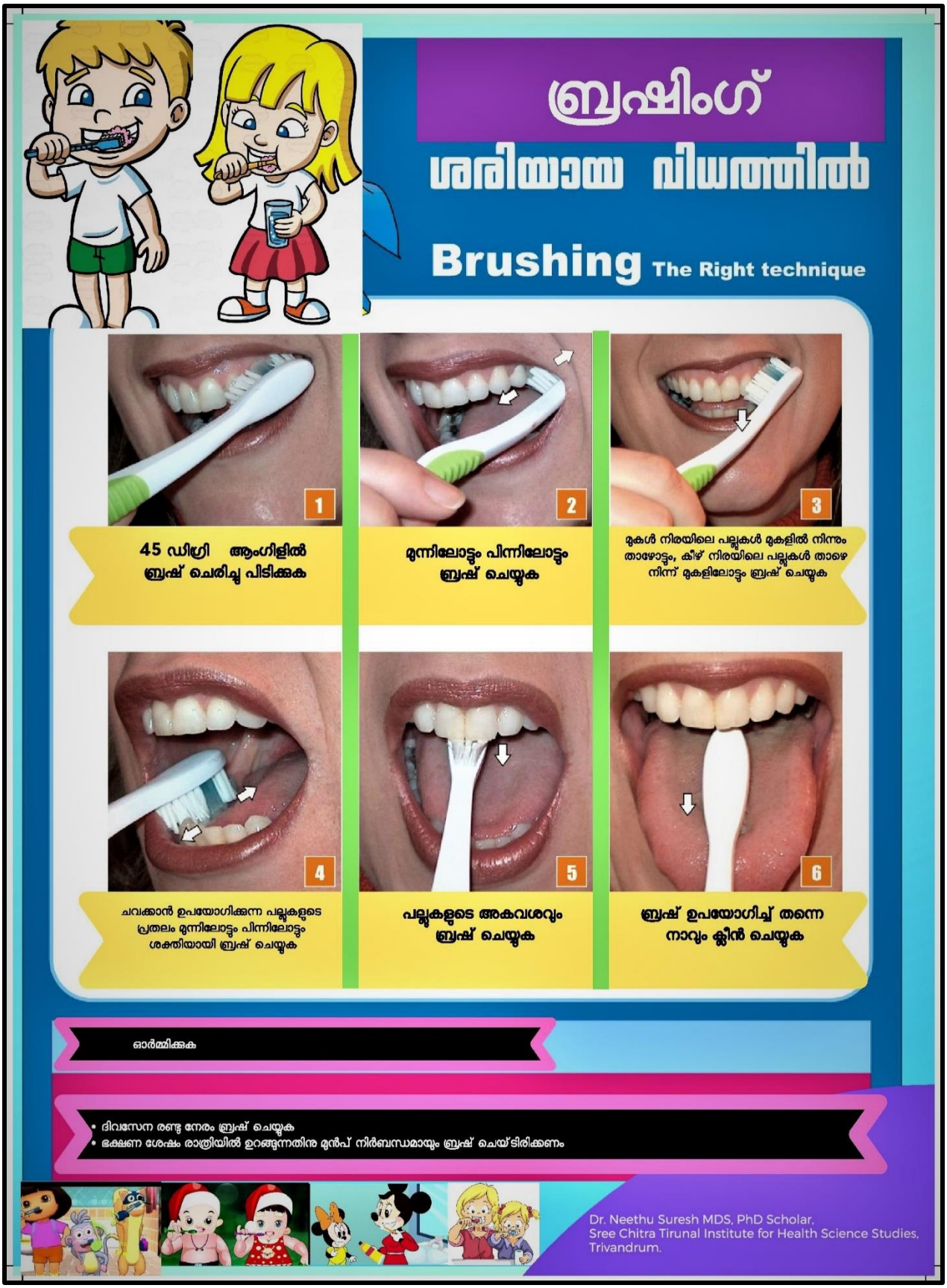
- പല്ലു വേദന വന്നാലോ മോണരോഗം വന്നാലോ വിക്സ്, ഗ്രാമ്പു ഓയിൽ, യൂക്കാലിപ്റ്റസ് ഓയിൽ, പെയ്ൻ ഔട്ട് എന്നിവ ഉപയോഗിക്കരുത്.
- ദന്ത ഡോക്ടറെ കാണാതെ പല്ലു വേദനയുടെ ഗുളിക ഉപയോഗിക്കരുത്.


- ദന്താരോഗ്യത്തിനായി ദിവസവും രണ്ടു തവണ ബ്രഷ് ചെയ്യണം.
- ടൂത് പേസ്റ്റ് ഉപയോഗിച്ച് ബ്രഷ് ചെയ്യുക.
- പയർ വലുപ്പത്തിൽ മാത്രം പേസ്റ്റ് എടുക്കുക.
- ബ്രഷ് ഉപയോഗിച്ച് നാക്ക് നന്നായി വൃത്തിയാക്കുക.
- പല്ലു വൃത്തിയാക്കാൻ ഉമിക്കരി, പൽ പൊടി, ഉപ്പു, മാവില തുടങ്ങിയവ ഉപയോഗിക്കരുത്.
- ഉമിക്കരി കൊണ്ട് പല്ലു അമർത്തി തേച്ചത് കൊണ്ട് പല്ല് വൃത്തിയാവില്ല, പല്ല് താഴത്തുമില്ല.
- മൂന്ന് മാസത്തിലൊരിക്കൽ ടൂത് ബ്രഷ് മാറ്റുക

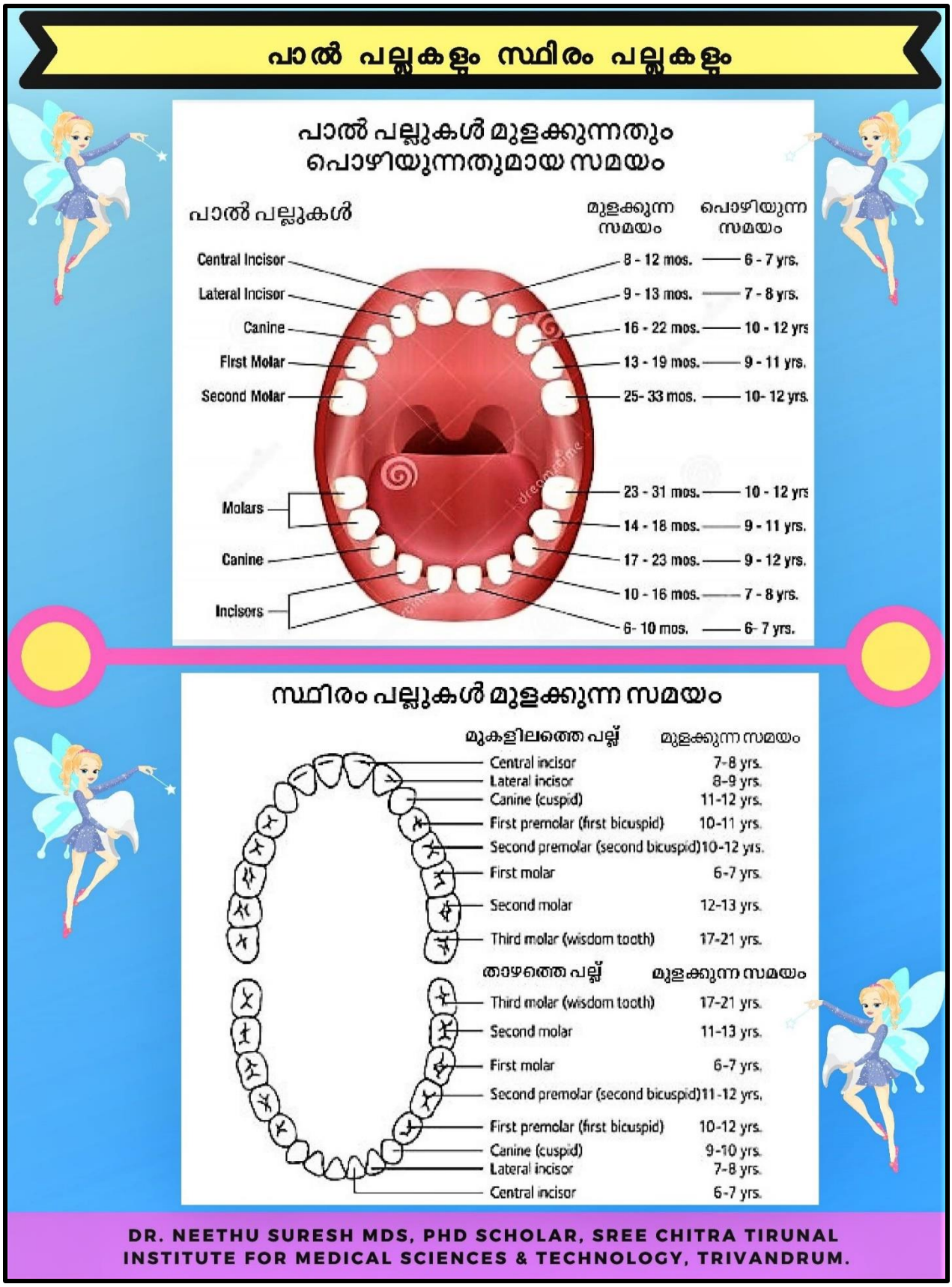
- ഭക്ഷണത്തിനു ശേഷം വായ് വൃത്തിയായി കഴുകുക അല്ലെങ്കിൽ വെള്ളം കുടിക്കുക.
- ലെയ്സ്, കുർകുറെ, പാക്കറ്റ് അച്ചാർ, ഓക്കെ ബിരിയാണി, സിപ്പ് അപ്പ്, പുളി മിട്ടായി, കട്ടമിട്ടായി, കൊക്കോക്കോള, പെപ്സി എന്നിവ ഉപയോഗിക്കരുത്, ഇവ ആരോഗ്യത്തിന് ഹാനീകരമാണ്.
- പാൻ മസാല ബീഡി സിഗരറ്റ് എന്നിവ നമ്മുടെ ആരോഗ്യത്തിന് ദോഷമാണ്. ഇവ ഒരിക്കലും ഉപയോഗിക്കരുത്.
- ദന്താരോഗ്യത്തിനായി 6 മാസം കൂടുമ്പോൾ ദന്ത ഡോക്ടറെ കാണുക.

Dr. Neethu Suresh MDS, PhD Scholar, Sree Chitra Tirunal Institute For Medical Sciences & Technology, Trivandrum.

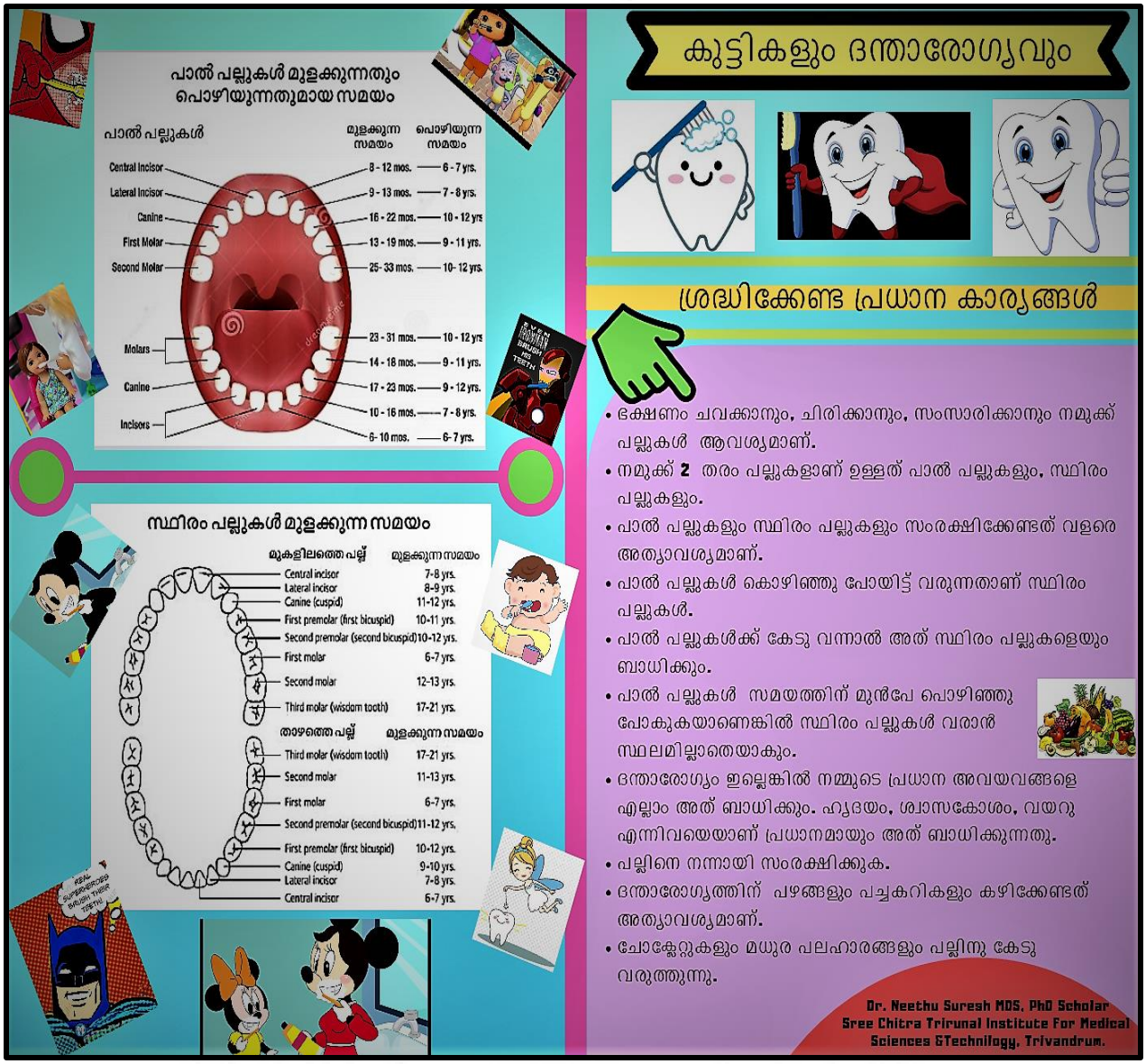
Appendix 32iii – Chart 3



Appendix 32iv – Chart 4

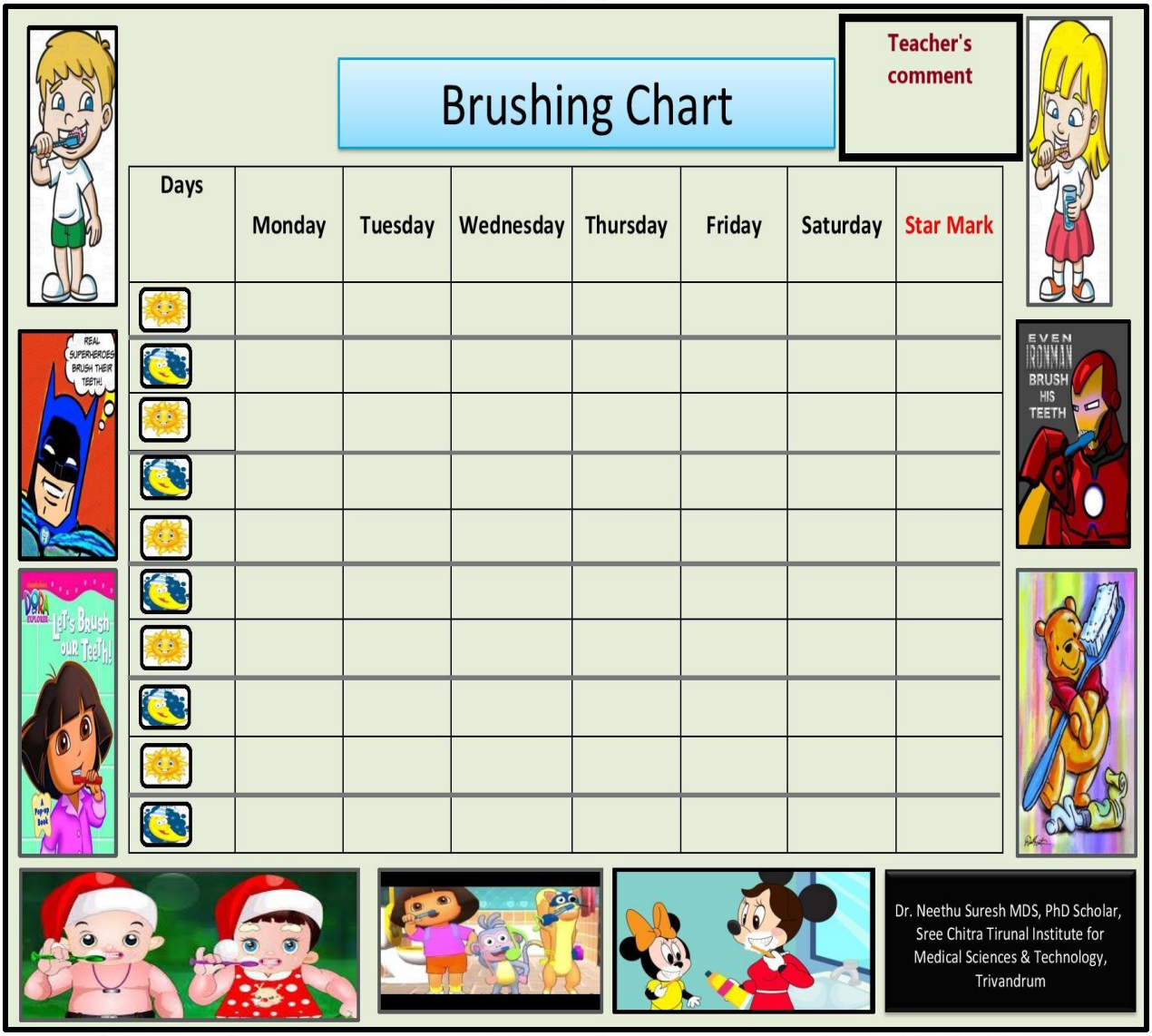


Appendix 33i – Pamphlet side 1



Appendix 33ii – Pamphlet side 2

Appendix 34 – The Brushing Chart



Appendix 35 – The Plagiarism analysis report

URKUND

Document Information

Analyzed document	Neethu Thesis for plagiarismcheck.docx (D77527083)
Submitted	8/6/2020 7:16:00 AM
Submitted by	jissa
Submitter email	jissa@sctimst.ac.in
Similarity	1%
Analysis address	sijsa.sctims@analysis.urkund.com

Sources included in the report

W	URL: https://www.scriptieprijs.be/sites/default/files/thesis/2019-10/Masterproef%20-%20 ... Fetched: 8/6/2020 7:19:00 AM	4
W	URL: https://worldwidescience.org/topicpages/o/oral+hygiene+behaviors.html Fetched: 9/28/2019 7:41:19 PM	3
W	URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4212389/ Fetched: 8/6/2020 7:19:00 AM	5
SA	**thesis 1.pdf** Document thesis 1.pdf (D34277757)	12
W	URL: https://www.science.gov/topicpages/o/oral+health+hygiene.html Fetched: 1/24/2020 12:20:30 PM	2
W	URL: https://worldwidescience.org/topicpages/c/childrens+oral+health.html Fetched: 8/6/2020 7:19:00 AM	1
W	URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3222359/ Fetched: 8/6/2020 7:19:00 AM	1
SA	**Dr. R.A.Sowmiya Sree- Thesis.docx** Document Dr. R.A.Sowmiya Sree- Thesis.docx (D60767334)	2
W	URL: https://www.science.gov/topicpages/o/oral+health+behaviour Fetched: 8/6/2020 7:19:00 AM	1
SA	**4326 Thesis Arjun Unnikrishnan GJ7929 MDS JNMC AMU.docx** Document 4326 Thesis Arjun Unnikrishnan GJ7929 MDS JNMC AMU.docx (D61041143)	1

Entire Document

EFFECTIVENESS OF A SCHOOL ORAL HEALTH EDUCATION INTERVENTION AMONG 6-12 YEAR OLD CHILDREN IN THIRUVANANTHAPURAM EDUCATIONAL DISTRICT: A CLUSTER RANDOMIZED CONTROLLED TRIAL