CORRELATE THE SELECTED RISK FACTORS AND LEVEL OF DENTAL CARIES AMONG SCHOOL AGE CHILDREN IN SELECTED SCHOOLS AT DHARAPURAM WITH A VIEW TO PREPARE A SELF INSTRUCTIONAL MODULE ON PREVENTION OF DENTAL CARIES.

A DISSERTATION SUBMITTED TO THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING 2010-2012
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Certified Bonafide Project Work
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Internal Examiner     External Examiner

COLLEGE SEAL

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THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI
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ABSTRACT

In India, school health survey identified that the common health problem among school children are malnutrition, infectious diseases, intestinal parasites, disease of skin, eye and ear and dental caries. Dental caries is one of the most common health problems among school children. So they recommended that a school health program should have provision for dental examination, at least once a year. Nurses take part in the teaching of dental hygiene to the teachers, children as well as parents.

The study was aimed to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram.

The research approach used for the study was descriptive approach. The research design used for the study was descriptive correlational design. Conceptual framework adopted in the present study was the modified Dorothea. E. Orem self care deficit theory of nursing (2001). The 6-10 year old school age children were selected by non probability convenience sampling technique. Dental caries was assessed by using international caries detection assessment system (2008). Risk factors were assessed by using rating scale. After the data collection the prevalence of dental caries was 548 out of 870 school age children. At the end of the data collection self instructional module regarding prevention of dental caries was distributed to samples. Severe cases were instructed to go for further treatment of dental caries. With the help of SPSS package (16.0 version) the collected data were analyzed and tabulated by using descriptive and inferential statistics.

The data analysis showed that 78 children had early decay, 152 children had established decay and 318 children had severe decay. The mean and standard deviation for selected risk factors among affected and unaffected school age children were 42.63 (SD±6.22) and 50.45 (SD±7.31) respectively. The Z value for selected risk factors were 16.13 (p<0.05) level, which denotes that there was a significant difference in risk factors of dental caries between affected and unaffected school age children. There was a negative correlation (r=-0.211) between the selected risk
factors and level of dental caries among affected school age children. There was no significant association of the selected risk factors of dental caries among affected school age children with their selected demographic variables except for age of the child ($\chi^2=22.205$), area of residence ($\chi^2=8.718$) and family history of dental caries ($\chi^2=10.548$). There was no significant association of the level of dental caries among affected school age children with their selected demographic variables. Logistic regression showed that there was a significant impact of risk factors (exponential B=0.988) on dental caries among school age children. The study findings revealed that adequate food and oral hygiene practices will help to maintain the good dental health status of school age children.
CHAPTER-I
INTRODUCTION

“Even pearls are dark before the whiteness of teeth”
William.R.Alger

BACKGROUND OF THE STUDY

Every child is “A beautiful angel with eyes of brown, who turned the world upside down, the smile makes the darkest day to bright, a gift from heaven and above, a perfect example of god’s precious love“. Children are wealth of the family.

When the child speaks and smiles with a honey lip movements attract the people and the shiny white pearl teeth easily catch the attention of all people. Teeth are essential for the beauty of mouth and also chewing the food and for the clarity of speech. Healthy teeth are essential for overall health, self esteem and proper speech development. Dental care in children is often neglected by both parents and professionals. Potential serious problems can result in the absence of proper preventive care and early recognition of problems with appropriate treatment. Primary teeth aid in food digestion and they also act as ‘spacers’ for the proper eruption and alignment of the permanent teeth.

Bilagi.A., (2011)

Eruption of teeth begins at about sixth month with wide variation in timing. All the twenty temporary teeth erupt by the age of 2.5 – 3 years. First permanent teeth erupt at 6 years of age. Problems of oral cavity like delayed teeth, malocclusion of teeth, dental caries, dental fluorosis, oral thrush, glossitis, gingivitis will also start to appear at this age. Among these complications, dental caries is very commonest among school children.

Children are major consumers of health care. In India, about 35% of total population is children below 15 years of age. Children are not only large in number but vulnerable to various health problems and considered as special risk group. Children always need special care to survive and thrive.

**Datta .P ., (2009)**

Oral health is an integral component of general health. It has also become clear that causative and risk factors in oral diseases are often the same as those implicated in major general diseases. The term oral health as “a state of sound and well functioning dental and oral structures as well as absence of dental fear and anxiety”.

**WHO., (2003)**

Dental caries is the most prevalent disease of teeth in children and is commonly known as tooth decay. It results from destruction of mineralized tissues (enamel and dentin) of the tooth by the microbial activity in the dental plaque. Predisposing factors are infection with streptococcus mutants and increased frequency of carbohydrate consumption by the child.


Dental caries is the leading dental problem of children. 90% of all children from socio economically deprived areas have more dental caries than those from other groups. Genetic factors, adequate diet, good oral hygiene, and the use of fluoride are the other important preventive factors.


Cleaning of teeth is an essential part of oral hygiene. If proper attention is not paid to cleanliness of teeth and if chewing gum, chocolates, sugar and sweets are used excessively, then teeth may develop dental caries and other diseases.

Decay is caused by bacterial action on carbohydrates in a plaque on the tooth surface, producing an acid environment that results in destruction of enamel. The most important aspect of decay prevention is proper diet. Sucrose is the major food component contributing to development of caries. The length of time the food is in contact with the teeth is also important. Sticky foods are most harmful, and frequent snacks of carbohydrates are more harmful than infrequent ones.

Waechter P.H., (1985)

High risk conditions for dental caries include faulty salivary gland function, drugs that cause xerostomia, gastro oesophageal reflux disease, bulimia, mental retardation, oral hygiene with inadequate dental care, Hereditary fructose intolerance deficiency and excess of fluoride are both harmful.


CONDITIONS NECESSARY FOR CARIES:

Figure: 1 Conditions necessary for caries

Source: Datta.T.,(1998)
Once teeth are present they can be attacked by acidogenic bacteria especially streptococcus mutans. Dental plaque accumulates on the surface of the teeth as an adherent film. As plaque grows bacteria accumultae within it. The third ingredient is a substrate for the bacteria. In case of dental caries carbohydrate – especially refined carbohydrate such as sucrose – is the most active in which the bacteria metabolises sucrose and produces considerable acid as a byproduct. This acidic environment reduces oral pH and dissolve the enamel, which is the beginning of caries. The teeth subsequently becomes necrotic and abscess occurs. It can lead to severe pain, swelling, sensitivity to temperature. Premature loss of teeth can cause orthodontic problem and growth and development problems.

_Datta.T.,(1998)_

The clinical features of dental caries are tooth ache, sensitivity to food stuffs, pus formation with severe pain, inability to chew, swelling in cheek, fever and gingivitis. Dental caries can be diagnosed by dental examination and intra oral radiographs.

_Nelson,(1996)_

Decayed teeth should be filled up by dental sealants and plastics after cleaning the cavity, as soon as possible. Localised dental infection can be managed by extraction, pulpectomy or root dental treatment. Antibiotics are indicated if the infection has spread to structures outside the dentoalveolar unit. Abscess, if present, should be drained and pus cultured. Recurrent infection can be prevented by maintaining good oral hygiene and reducing the frequency of consumption of carbohydrate or sugar rich foods or drinks. If it is not treated earlier it may lead to complications such as pulpitis, dental abscess, periapical abscess, sepsis and endocarditis.

_Piyush.G.,(2008)_

Child should be taught to perform dental care by self with the supervision and guidance of parents and the parents should monitor their
child’s effort until (8-9 years of age) the child can assume full responsibility. Parents should limit the intake of sweetened liquids including fruit juices and snacks, brush their teeth with soft bristles and flouride tooth paste, focusing on the junction between the gums and teeth.

**Potts.L.P., (2007)**

Daily brushing and flossing of the teeth helps to prevent caries and periodontal disease. Studies have shown that most children under 10 year of age do not have the eye-hand coordination required for adequate oral hygiene; accordingly, parents should assume responsibility for brushing. The degree of parental involvement should be appropriate to the child’s growing ability.

**Nelson., (1996)**

A large number of children and parents have limited knowledge of the causes and prevention of the dental caries. In India, a very less percentage of mothers had received proper advice on oral care of the children from dentists or health care workers. The children brushing their teeth is very unsatisfactory and many are using the traditional cleaning aids like salt and oil, coal ash and locally made powders, cultural beliefs and social taboos play an important role in the perception of the causes of dental decay. This high prevalence of dental caries has also caused increase in the absenteeism of school hours and loss of working hours and economy for the parents. Apart from this, the treatment of dental caries is not available to all because of lack of facilities in their areas. The school teacher’s oral health knowledge has also not been satisfactory.

**Edith, (2011)**

The American dental association (ADA) joins with the World Dental Federation, the worldwide voice of the dental profession, in observance of the annual “World Oral Health Day “on September 12. The purpose of this day is to increase global awareness for oral health, as well as the impact of oral diseases on general health and wellbeing. 2011 theme is “Non-communicable Diseases – The Importance and Relations with Oral Diseases”. As per reports,
Bad oral health is directly related to a number of chronic diseases especially those affecting the vital organs including heart, kidney and lungs.


In India, the Indian Dental Association (IDA) was founded in 1945 with Dr. R. Ahmed, being the founder president. This is the only organization that has represented dental professionals and the oral health of the nation for past 65 years. The council on dental health (CDH), a strong offshoot of IDA, plans and organizes oral health programs. These include dental health education in schools, dental camps, exhibitions, distribution of free dentures, essay writing and painting competitions and other related activities on a regular basis. The national oral health programme was launched in 1999 to combat the ever increasing patient load and reduce the morbidity due to oro-dental problems in the country.


In India, school health survey identified that the common health problem among school children are malnutrition, infectious diseases, intestinal parasites, disease of skin, eye and ear and dental caries. Dental caries is one of the most common health problems among school children. So they recommended that a school health program should have provision for dental examination, at least once a year. School health nurse take part in the teaching of dental hygiene to the teachers, children as well as parents.

**Park.k., (2009)**

All over the world, dental caries (tooth decay) still remains one of the most common oral health problem among children. A considerable population of children in the developing nations is being affected by tooth decay and most of the time; proper treatment is given the last priority owing to limited access to oral health services. The high prevalence of dental caries has also caused increase in the absenteeism of school hours and loss of working hours and economy for parents. There is no single country that claims to have dental caries free children.

**WHO, (2011)**
NEED FOR THE STUDY

Health is not complete without oral health and health for all by the year 2025 can only be achieved through the medium of primary health care approach. The concept of dental health under the theme “Health for all by 2025 A.D” is a significant issue among human beings because 95% of all human beings have one or other dental problem at least once in their life time among which major portion comes from paediatric population.


Dental problem, mostly in the form of caries (tooth decay) and gum disease are common in developed countries, affecting 60-90% of school children and the vast majority of adults. WHO estimation of global decayed missed filled teeth for 10 years old children reported that in the 188 countries in their database, that on a global basis, 200,335,280 teeth were decayed, filled or missing among just that age group. Approximately 1 in 2 or 55.57% or 151.2 million peoples are affected with dental caries in USA.


The prevalence rate of caries increases steadily across the life span; 18% of children between ages 2-4 years have caries, where as 52% of children between ages 6-8 years have caries in United States.

Wong’s., (2009)

In United States (2001-2004), prevalence of untreated dental caries was 19.5% in children aged between 2-5years and 22.9% in children aged between 6-19years. In that 23.9% children were males and 22.0% children were female.


Hospitalizations for dental caries at public hospitals occurred in 6.3 people per 10,000 populations in Australia (Australian Hospital Data, Australia, 2001-02). 89% of hospital consultant episodes for dental caries were
single day episodes in England (Hospital Episode Statistics, Department of Health, England, 2002-03).


According to WHO oral health survey, 50% of 8 year old children (2003, UK), 50% of 5-9 years old children (2004, USA), 84% of 5-6 years old children (2006, Mexico), 78.5% of 7-9 years old children (2006, Argentina), 40% of 0-6 years old children (2007, Brazil), 84% of 5-8 years old children (2008, China) and 92.3% of 6-12 years old children were affected with dental caries (2006, Philippines).


The dental caries prevalence rate in the year of 2000, 2005, and 2010 was 2084.7 lakhs, 5484.6 lakhs, and 5869.0 lakhs including all age group in India. In 2015 the dental caries prevalence is expected to raise about 6231.8 lakhs.

**Mahal.A., (2010)**

A very extensive and comprehensive national health survey was conducted in 2004 throughout the entire country of India in order to ascertain the oral health status and prevalence of dental caries and dental disease in representative age groups. The following prevalence rate of dental caries was reported for the various age groups examined, for both coronal and root surface.

- 51.9% in 5 year old children.
- 53.8% in 12 year old children.
- 63.1% in 15 year old teenagers.

**-WHO, (2004)**

The high caries prevalence of 77.7% in the school children of Nainital, Uttarpredesh, indicates the enormity of oral health problems in the rural areas. If remained unattended and untreated, the percentage is likely to increase in
future. The data reflects on the poor hygiene, low awareness about the oral health. Higher DMFT (Decayed Missed Filled Teeth) in the age group of 10-12 years appears to be due to increased exposure of the susceptible tooth to poor oral hygiene conditions, because dental caries is a continuous and cumulative process. The intra-analysis of DMFT (Decayed Missed Filled Teeth) showed more than 80% of decayed component, which shows lack of awareness and access to dental facilities available.

Grewal.H., (2011)

Dental caries is most common- non communicable disease in the world. There is a slight increase in prevalence of dental caries in Tamil Nadu. In 1973, the prevalence rate was 47.8% and in 2004, it was 49.8%. High prevalence rate was observed in rural areas. Survey conducted by Indian Dental Association (IDA) in rural Tamil Nadu found that a high prevalence of dental caries was 70.2% in 6 year old children. 40% of the children are using fluoride tooth paste, 57% of children are using tooth brush and only 3.9% are brushing twice per day in Tamil Nadu. In Tamil Nadu, dentist to population ratio in urban area is 1: 10,000 and in rural area is 1:250,000.


Alexandra Saldarriaga Cadavid, et.al., (2010) conducted a cross sectional study on primary dental caries among 6-10 year children in Medellin, Colombia. 447 samples are selected by random sampling technique. The prevalence of caries (treated and untreated) was 74.9% (335). The mean dmf (decayed, missed, filled) was 7.6+/-9.7. Cavitated lesions were more frequent on smooth surfaces than on occlusal surfaces (respectively 64.7% and 46.8%; p value < 0.001). Only 25.1% (112) of the children had no clinical signs of caries according to the ICDAS (international caries detection assessment system). It was concluded that dental caries is a highly prevalent condition in Colombia. There was an association between caries and oral hygiene practices and eating habits.
Joshi et al. (2005) conducted a study on prevalence of dental caries among school children in Kulasekaram, Kanyakumari district, Tamil Nadu. A total of 150 children in the age group of 6-12 years with an equal distribution of 75 boys and 75 girls were included in the study. Out of the total population, 77% of the children were affected by dental caries. Distribution according to the gender showed that 80% of the boys and 73% of girls were affected with dental caries. There was a highly significant difference among boys and girls in their knowledge about dental decay and their fear of the dentists. Boys exhibited more knowledge about dental decay and less fear toward dentists as compared to girls.

During clinical posting, the researcher has done the physical examination of the school going children and found that majority of the children had dental caries in their temporary and permanent teeth. The oral habits of the children were enquired, and identified the lack of knowledge about oral hygiene, dental care and eating habits among school children. This probed the researcher to create awareness among school children regarding dental caries.

**STATEMENT OF PROBLEM**

A study to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram with a view to prepare a self instructional module on prevention of dental caries.

**OBJECTIVES**

1. To assess the prevalence of dental caries among school age children
2. To assess the level of dental caries among school age children.
3. To assess the selected risk factors of dental caries among school age children.
4. To correlate the selected risk factors and level of dental caries among affected school age children.
5. To compare the selected risk factors of dental caries between affected and unaffected school age children.
6. To find the impact of risk factors on dental caries among school age children.
7. To find association of the selected risk factors of dental caries among affected school age children with their selected demographic variables.
8. To find association of the level of dental caries among affected school age children with their selected demographic variables.

OPERATIONAL DEFINITION

1. RISK FACTORS

Factors that increase the probability of developing a disease or health problem.

Allender., (1996)

In this study, food and oral hygiene are the selected risk factors which includes high carbohydrate diet, frequency and duration of eating habits, brushing technique and dental check up. It influences the oral health to produce dental caries which is measured by three point rating scale and its scores.

2. DENTAL CARIES

Dental caries is an erosive process that begins with the action of bacteria on fermentable carbohydrate in the mouth, which produces acids that dissolve tooth enamel and cause tooth decay.

Kamalam.s., (2005)

In this study it refers to level of dental caries which is measured by International Caries Detection Assessment System (ICDAS 2008) and its scores.

3. SCHOOL AGE CHILDREN

The segment of the life span that extends from age 6-12 years, these middle years often referred to as school age or the school years.

Wong’s., (2009)
In this study it refers to 6-10 years old school going children.

4. SELF INSTRUCTIONAL MODULE

A learning package for achieving pre specified objectives; a module is self contained and includes the instructional material a necessary for the learning of specific unit or topic.

Santombi devi elsa., (2009)

In this study, it refers to a structured, sequentially arranged and written in simple language to facilitate self learning, which is prepared by the researcher, intended to provide information to the school children, regarding dental caries definition, causes, risk factors, clinical manifestations, investigations, management, home remedies for tooth ache, prevention, brushing technique, complications, do’s and don’ts related to dental caries.

HYPOTHESES

H₁- There will be a significant correlation between the selected risk factors and level of dental caries among affected school age children.

H₂- There will be a significant association of the selected risk factors of dental caries among affected school age children with their selected demographic variables.

H₃- There will be a significant association of the level of dental caries among affected school age children with their selected demographic variables.

ASSUMPTION

- School children are more vulnerable to get dental caries.
- Early identification of dental caries can prevent further complications.
- Paediatric nurse plays a vital role in promotion of good oral habits among children.
DELIMITATIONS
This study is delimited to,

- The data collection period is 5 weeks only.

PROJECTED OUTCOME
Dental caries assessment may bring the dental health awareness among school age children. Developing and distributing a self instructional module regarding prevention of dental caries will improve the knowledge, attitude and practice regarding oral health among the school age children. It helps to enable the school age children to prevent themselves from getting dental caries. They can prevent the occurrence and spread of dental caries from one tooth to another. Children may pass the information regarding the prevention of dental caries through child to child approach, so that the large number of pediatric population may benefit and prevent the dental caries and its consequences and lead a caries free life.
CONCEPTUAL FRAME WORK

The conceptual framework adopted for the study was “Modified Dorothea.E. Orem self care deficit theory of nursing (2001)” . The theory of self care which describes why and how people care for themselves. The theory describes and explains self care and promotes the goal of patient self care.

The theory concepts are as follows,

- Self care
- Self care agency
- Self care demand
- Nursing agency
- Deficit

SELF CARE

According to theorist, self care comprises those activities performed independently by an individual to promote and maintain personal well-being throughout life.

In this study, it refers to oral health practices performed by the children independently in order to promote and maintain the dental health status throughout their life.

SELF CARE AGENCY

According to theorist, self care agency is the individual’s ability to perform self care activities. It consists of two agents: self care agent refers to person who provides the self care. Dependent care agent refers to person other than the individual who provides the care, such as a parent who care for a child.

In this study, self care agent refers to children are practicing good oral hygiene and proper dietary pattern. Dependent care agent refers to parents has motivate, support and supervise oral health practices of their children.
SELF CARE DEMAND:

According to theorist, self care demand refers to those self care activities required to meet the self care requisites. It involves the use of actions to maintain health and well being; each patients therapeutic self care demands varies throughout life. It can produce a self care deficit when it exceeds the patient’s self care agency.

In this study, it refers to good oral health practices, healthy diet pattern, adequate knowledge and practice regarding prevention of dental caries (diet, brushing technique, avoidance of risk factors) and regular dental health check up. These self care activities are required to the children to engage in self development.

NURSING AGENCY:

According to theorist, nursing agency comprises developed capabilities of persons educated as nurses that empower them to represent themselves as nurses and within the frame of a legitimate interpersonal relationship to act, to know, and to help persons, in such relationships to meet their therapeutic self care demands and to regulate the development or exercise of their self care agency.

In this study, it refers to the researcher who identifies the risk factors and level of dental by rating scale and ICDAS and distributes self instructional module regarding prevention of dental caries to school age children, which will promote oral health and prevent dental caries.

DEFICIT:

According to theorist, self care deficit is a relationship between the persons therapeutic self care demands and their power of self care agency in which constituent developed self care capabilities within self care agency are not operable or not adequate for knowing and meeting some or all components of the existent or projected therapeutic self care demand.
In this study, it refers to improper dietary pattern, poor oral hygiene, ignorance of dental care and lack of knowledge and practice regarding prevention of dental caries among school age children.
SELF CARE

Children perform oral health practices independently to promote and maintain dental health status throughout the life.

SELF CARE AGENCY

Self care agent: Children practicing good oral hygiene and proper dietary pattern.

Dependent care agent: Parents have to motivate and supervise oral health practices of their children.

SELF CARE DEMAND

• Good oral health practices
• Healthy diet pattern
• Adequate knowledge and practice regarding prevention of dental caries (diet, brushing technique and oral hygiene)
• Regular dental checkup.

DEFICIT

• Improper dietary pattern
• Poor oral hygiene
• Ignorance of dental care
• Lack of knowledge and practice regarding prevention of dental caries.

NURSING AGENCY:

Risk factors and level of dental caries were assessed by rating scale and ICDAS. Self instructional module was distributed to school age children regarding prevention of dental caries.

R – Relationship Between Components, < - Current Deficit.

FIG – 2: CONCEPTUAL FRAMEWORK BASED ON MODIFIED DOROTHEA. E. OREML SELF CARE DEFICIT THEORY OF NURSING (2001)
CHAPTER – II
REVIEW OF LITERATURE

The review of literature for the present study has been from published articles, text books, reports and Med Line search and it is organized as follows.

PART-I

Over view of dental caries

PART-II

Section A:  Studies related to prevalence and incidence of dental caries.
Section B:  Studies related to relationship between risk factors and dental caries.
Section C:  Studies related to role of nurse in prevention of dental caries.

PART-I
OVER VIEW OF DENTAL CARIES

Introduction

Dental caries is the most widely prevalent chronic (but non-killing) disease of mankind. The disease begins in early life and victim experiences its consequences throughout the rest of his or her life. In India caries is the commonest disease in children of school going age.

Definition:

Dental caries is a progressive and destructive process causing decalcification of the tooth enamel, destruction of dentin and cavitations of the teeth. It can spread into the pulp and may cause inflammation and abscess.

Etiology:

1. An important experimental observation has been that dental caries have microbial specificity; that is, cariogenic potential resides in a group of oral streptococci collectively designated streptococcus mutans. Current knowledge indicates that these organisms initiate most dental caries of enamel surfaces. Once the enamel surface cavitates, other oral bacteria (in particular the lactobacilli) invade the underlying dentin and cause further destruction of tooth structure through a mixed bacterial infection.

2. A second important aspect of the etiology of dental caries relates to frequency of carbohydrate consumption. Frequency of ingestion is a more important determinant of development of dental caries than is the actual quantity of carbohydrate consumed.


Risk factors:

- Carbohydrates rich foods, especially chocolates which stick to the teeth, chewing gum, cola beverages
- Poor oral hygiene
- Salivary gland dysfunction
- Receiving long term therapy with drugs that cause xerostomia.
- Gastroesophageal reflex
- Bulimia
- Rumination
- Mental retardation
- Hereditary fructose intolerance
- Deficiency and excess of fluoride

Stages of dental caries:

![Stages of dental caries](image)

**Source:** Rao.S., (2007)

1. Early Stages: Acids dissolve the enamel in the crown of the tooth.
2. Moderate Tooth Decay: The dentine is attacked by acids and bacteria invade the cavity.
3. Advanced Tooth Decay: Inflammation of the pulp.
4. Necrosis: Death of the pulp tissue.
5. Periapical Abscess: An abscess forms at the apex of the root.

**Pathophysiology**

Due to causative agent which produces an extracellular polysaccharide and forms a plaque over the teeth. Gradually tooth decay begins following demineralization of enamel. Destruction of dentin with cavity formation occurs and causing inflammation, abscess formation.


**Clinical features**

- Dental caries is found as pits and fissures of biting surfaces of teeth
- Cavity formation, involvement of pulp, periapical abscess, dental abscess or sepsis
- Toothache, sensitive to food stuff
- Pus formation with severe pain
- Not able to eat anything
- Swelling in cheek
- Fever, gingivitis

**Kamalam., (2005)**
Diagnostic evaluation:
- Oral examination
- Dental X-ray

Management:
1. Dental caries should be treated with analgesics to relieve pain and tooth extraction or pulpectomy and involvement of tissues outside the dentoalveolar unit requires antibiotics mainly in infection of submandibular space, periorbital space and facial triangle.
2. Incision and drainage of the abscess and send for culture and gram stain to identify the organism.
3. Blood culture should be obtained prior to initiating parenteral antibiotic therapy.
4. Penicillin is the drug of choice, except in patient with a history of allergy to this agent; clindamycin and vancomycin are suitable alternatives for such patients.

Preventive measures:
- Dietary modification by reducing carbohydrate rich food intake and avoiding oral retaining
- Using fluoride tooth paste
- Avoidance of chewing gum, chocolate, beverages, bottle feeding, use of pacifiers
- Good oral and dental hygiene with correct technique of tooth brushing
- Dental sealants and plastics to be applied to seal the pits and fissures on occlusal surfaces of teeth
- Mechanical removal of plaque and debris of the teeth are essential
- Regular dental check up for early detection of problem and necessary advice.
Complications:
1. Dental caries destroys the tooth
2. Pulpitis
3. Dental abscess
4. Periapical abscess
5. Sepsis
6. Facial cellulitis
7. Growth and development problems


PART-II
Section A: Studies related to prevalence of dental caries

Grewal.et.al.,(2011) conducted a study to estimate the prevalence of dental caries and treatment needs in school going children of Delhi. A school based cross-sectional study was conducted in various educational zones of Delhi. A total of 520 school children in age range of 9-12 years were examined using WHO (1997) criteria. The prevalence of dental caries was found to be 52.3% with mean deft and DMFT of $0.5038 \pm 1.0859$ and $0.8250 \pm 1.3437$, respectively. Besides various treatment needs 49.7% required restorative treatment.

Saravanan.S.et.al.,(2008) conducted a study on prevalence and treatment needs of rural school children in Chidambaram taluk, Tamil Nadu. 508, 5-10 year-old school children (247 boys and 261 girls) were surveyed. Dental caries was assessed using diagnostic criteria recommended by WHO (1997). The chi-square test and two-way analysis of variance were used for statistical analysis. Caries prevalence was 71.7 and 26.5% in primary and permanent dentition, respectively. The mean decayed missing filled tooth and decayed missing filled tooth (DMFT) scores were 3.00 and 0.42 respectively. The mean decayed missing filled tooth scores were not statistically significant different for the two sexes, the mean DMFT (decayed missing filled tooth and decayed missing
filled tooth) score was found to be higher among girls than boys ($P < 0.02$). Dental caries is a significant public health problem in this population.

**Dhar.V.et.al.,(2007)** conducted a study regarding Prevalence of dental caries among school-going children of rural areas in Udaipur district, Rajasthan, India. A 1587 (827 were boys and 760 were girls) government school children in the age group of 5-14 years was selected by random sampling method. Dental caries was found in 46.75% children, and 76.87% children required some kind of dental treatment. Caries prevalence in the age group of 5-7, 8-10 and 11-14 years were 18.62%, 49.23% and 51.48%. The difference between the age groups of 5-7 and 8-10 years was highly significant, whereas the difference between the groups of 8-10 and 11-14 years was not significant. The difference between the groups of 5-7 and 11-14 years was also highly significant. The caries prevalence of boys was 48.13% and that of girls was 45.26% and the difference was found to be in significant.

**Saravanan.et.al.,(2006)** conducted a descriptive study to assess the pattern of prevalence of dental caries in the primary dentition among 8 year old children in Pondicherry among 1009 school children of both sexes (527 boys and 482 girls). A simple random sampling method was used to select the schools. Dental caries was assessed by the Dentition status and Treatment Need (WHO 1997). Statistical analysis was done using the Proportion test. The prevalence of caries was 44.4% among the study population, being higher in the boys ($P < 0.05$); In Mandibular arch in both the sexes (boys $P < 0.05$, girls $P < 0.01$); in posterior teeth (both sex wise & arch wise). Comparison of caries among anterior teeth (Boys vs. Girls) [corrected] and posterior teeth (upper vs. lower) revealed higher caries prevalence in Maxillary anterior teeth ($P < 0.001$) and Mandibular posterior teeth ($P < 0.001$). In both the sexes and arches, primary second molars showed higher caries prevalence.

**Dong-Hun Han.et.al.,(2006)** conducted a cross sectional study to determine the prevalence of dental caries in Korean children at school. 9740 children aged
6-16 years were taken by using stratified cluster sampling method. Decayed missing filled tooth and fissure sealants were recorded by WHO criteria. Decayed missing filled tooth scores for the 12 year old children were 2.16. The oral health of Korean children improved considerably between 2000 and 2006 through improvement in lifestyle and the strong public oral health programme, which should be continued in order to improve oral health in Korea. The prevalence of caries free permanent dentition also increased, average SIC index from 6-16 years also decreased. Prevalence of fissure sealants also increased (40%) in 9-11 years.

Martignon, et.al., (2005) conducted a study to determine the dental caries status in 10 year old children in state of Huila, Colombia. 110 samples are selected by random sampling technique. A clinical examination was done after brushing, by using a portable dental unit and headlight. Dental caries was assessed by using ICDAS visual criteria. Mean DFS including cavitated and non cavitated lesions were 10, 8, 5.1. It is higher in girls than boys. The dental caries scoring categories are score 1 0.9%; score 2 15.5%; score 3 61.8%; score 4 16.4%; score 5 3.6%; score 6 1.8%. All children are affected with dental caries.

Dragheim. E.et.al., (2005) conducted a cross sectional study to assess the dental caries in school children of an Estonian and a Danish municipality, Denmark. All children in the two countries were examined by calibrated dentists for dental caries according to the Recording System for the Danish Public Dental Health Service. In Estonia, 195 children aged 7 and 215 children of age 12 were selected in the municipality of Tartu in schools identified for oral health promotion projects. In Denmark, the study included 637 7-year-olds and 642 12-year-olds living in the municipality of Danish. At age 7, 83.8% of Estonian children had dental caries (7.7 dmfs) against 62.1% of Danish children (5.3 dmfs). At age 12, the mean caries experience was 2.1 DMFS in Estonia against 1.3 DMFS of the Danish children.
Bajomo. A.S.et.al.,(2004) conducted a study to assess the prevalence and severity of dental caries among school children in Venda, South Africa. Descriptive analytical study design was used. 519 school children in the age groups of 6, 12 and 15 years were examined by using WHO diagnostic criteria. Both the schools, which were divided into rural and peri-urban locations and the children that participated were randomly selected. A mean dmft (SD) of 2.68 (3.29) in 6 year olds and a mean DMFT decayed missing filled Teeth (SD) scores of 0.61(1.50) and 1.26 (2.18) were recorded in the 12 and 15 year olds respectively. In the 6 year olds the upper anterior teeth showed highest susceptibility to caries. At ages of 12 and 15 the mandibular molars were the teeth most affected. This study indicates that preventive oral health measures should be implemented on the younger age groups in order to control dental caries.

Gopinath.VK.et.al.,(2003) conducted a study with the purpose of evaluating the prevalence of dental caries, in semi urban school children in Chennai, Tamilnadu. The sample comprised of 415 school going children. Decayed missing filled tooth scores were recorded as per WHO 1987 criteria. Mean DMFT was found to be 0.17, 0.06 in male and female children at 3 to 6 age group which increased to 1.21 & 1.10 in males and female in 9 to 12 year age group. Mean dmft (decayed missing filled tooth and decayed missing filled tooth ) at 3 to 6 years was 1.36, 1.17 in male and female children which further increased at 6 to 9 years in both sexes but in the 9 to 12 year age group the value decreased to 1.48, 0.87 in male and female children respectively. The entire sample showed a dental caries prevalence of 58.1.

Rao.A.et.al.,(2001) conducted a study on prevalence of dental caries among school children of Moodbidri in Udupi district, Mangalore. This survey was carried out among 2902 children aged between 5 and 12 years attending 13 primary schools. The oral health status was assessed using the simplified WHO Oral Health Assessment Form. The caries prevalence was found to be 76.9%. The mean DMFT (decayed missing filled tooth and decayed missing
filled tooth) score was 0.78. The mean DMFT (decayed missing filled tooth and decayed missing filled tooth) was found to be higher among males compared to females. It was also found that the mean DMFT (decayed missing filled tooth and decayed missing filled tooth) score increased with age whereas the mean deft score decreased with age.

Singh.AA.et.al.,(2000) conducted a study on prevalence of dental caries among rural school children in Haryana. 688 boys and 331 girls in the age group of 10-16 years were selected randomly. WHO, DMFT criteria (1997) was used to assess the dental caries. Dental caries was found to be 39.4%. It was 37.9% in boys and 42.6% in girls. The difference between males and females was statistically not significant. A significant increase in prevalence of dental caries with age was observed (i.e. 33.1% in 10-year-old children to 45.8% in 16-year-old children). The mean DMFT per child was found to be 1.03 and DMFT per affected child was 2.6. The mean of D, M and F was found to be 1.0, 0.03 and 0.0 respectively.

Section B: Study related to the relationship between the risk factors and dental caries:
Diaz – cardenas.S.et.al.,(2011) conducted a cross-sectional descriptive study to assess the prevalence of dental caries related to family factors in school children from the city of Cartagena in Colombia. 243 samples were taken. Dental caries prevalence was measured by using ICDAS (international caries detection assessment system) criteria and questionnaire was used for measuring family functioning. Caries prevalence was 51 % (45-95 59 %CI). It was shown that 38 % (31-44 95 %CI) of parents had reached secondary school (but not completed it), 44 % (39-54 95 %CI) were living with a partner, 47 % (40-53 95 %CI) had low socioeconomic status, 53 % (47-57 95 %CI) were living in nuclear families, 47 % (41-53 95 %CI) were receiving less than minimum wage income, 66 % (58-70 95 %CI) were affiliated to the government health system and 59 % (52-66 95 %CI) were living in dysfunctional families.
Bivariate analysis only revealed statistical significance regarding the fathers incomplete secondary schooling and the presence of dental caries (p=0.04).

**Msolla.R.P.et al.,(2011)** conducted a cross-sectional study to assess the knowledge on causes and prevention of dental caries among school children in two secondary schools in Dares Salaam, Tanzania. Using self administered structured questionnaire, knowledge on causes and prevention of dental caries was assessed. Analysis was done using SPSS and statistical level of significance was reported as p<0.05. Most students who had adequate knowledge on causes and prevention of dental caries were in age group 8-12 years and males were more knowledgeable than females. Participants had knowledge that dental caries can be caused by frequent consumption of sugary substances (66.3%), consuming sticky sugary foods (62.6%) and they also knew that staying with an open cavity for long time could predispose other teeth to develop caries (62.8%). Males of age 8-12 years knew that proper tooth brushing can prevent dental caries (64%), and excessive rinsing after tooth brushing can reduce the effect of fluoride in tooth paste (66%).

**Guido JA.et al., (2011)** conducted a study to evaluate Caries prevalence and its association with brushing habits, water availability, and the intake of sugared beverages among school children in rural Mexico using. The International caries Detection and Assessment System (ICDAS ) showed that the caries prevalence in the villages was very high, ranging from 94.7% to 100% of the children studied. The mean number of surfaces with lesions per dmfs having scores ≥1 (noncavitated and cavitated) + child DMFS 15.2. Many of the children reported ± 11.1 to 26.6 ± ranged from 15.4 drinking beverages containing sugar. The study also concluded that the beverages, poor oral hygiene habits, and lack of access to tap water were identified as risk factor for caries in this sample of residents of rural Mexico.

**Thomas.P.Shija.,(2010)** conducted a study on dental caries and oral health practice among school children in a selected school in Palakkad Dist, Kerala.
Population was school children of the age group of 10-15 years selected by purposive sampling technique. The sample size included 40 cases and 80 controls. Semi structured questionnaire was used to collect the details. Dental caries identified by screening form of dental caries. There was significant association between oral health practice and dental caries ($X^2=24.502$, $P<0.05$). There was no significant association between brushing technique and dental caries among cases and controls ($X^2=0.000$, $P>0.05$). There was no significant association on initiation of brushing and dental caries (OR=6.061). There was no significant association between dental caries and age, sex, education of mother, occupation of mother, family income and family history of dental caries ($p>0.05$).

Christian.B.et.al.,(2009) conducted a cross sectional study to (i) test the hypothesis that urbanization is a risk factor for dental caries in children aged 6 and 12 years in Kollam, Kerala; and (ii) identify other possible risk factors for dental caries. The subjects were stratified by socio-demographic status into urban middle class, urban poor, and rural poor. Caries experience was measured by visual examination of teeth according to the World Health Organization criteria. Data on potential risk factors were collected using a close-ended, structured, and interviewer-administered questionnaire. Data modelling was conducted using logistic regression analyses. 876 children were examined; 53% of 6-year-olds and 90% of 12-year-olds examined were caries free. The caries experience rates were 1.40 decayed, missing, or filled primary teeth and 0.15 Decayed, Missing, and Filled Teeth (DMFT) for the 6- and 12-year-olds, respectively. Urban children did not have a higher caries experience compared with rural children. The only risk factor associated with a significant difference in DMFT scores was the dental visiting pattern. Children who visited the dentist had a significantly higher mean DMFT score ($P = 0.009$).

Reisine.S. et.al.,(2008) conducted a correlation to assess the relationship between Caregiver’s and Child’s caries prevalence in Detroit. A representative
sample of 1021 children (4-8 years) and their caregivers were recruited using a stratified probability sampling in Detroit and the caries was measured using the International Caries Detection and Assessment System. Negative binomial regression techniques were used for the multivariable analyses and the results showed younger children (ages 4-6 years) had lower caries rates with 24% having one or more non cavitated lesion, 18% having a cavitated lesion and 31% with any lesion compared with 78%, 51% and 81%, respectively, among the 7- to 8-year olds and the Caregivers caries levels were modestly correlated with children's caries. Dental caries was significantly associated with family income.

Retnakumari.,(2007) conducted an epidemiological survey attempted to establish the prevalence and severity of dental caries among primary school children of Varkala municipal area of Kerala. The prevalence of dental caries was 68.5% with a standard error (SE) of 1.64% and 95%, confidence interval (CI) 65.18, 71.82. The highest caries prevalence was found among 10 year age group (75.9%) and lowest in the 8 year age group (63%). The highest dmft score was found in 9 year age group 2.73 +/- 0.443 and highest DMFT score was found in 12 year age group 2.06 +/- 0.3824. Statistically significant association was found with dental caries and oral hygiene status odds Ratio (OR) 3.59, 95% CI, 2.53, 5.06 and oral cleanliness (OR 2.73, 95% CI 2.96, 3.82). Statistically significant association was found between low socioeconomic status and prevalence of caries.

Sowole .A.et.al.,(2007) conducted a cross sectional study to determine the dental caries pattern and predisposing oral hygiene related factors in Nigerian school children involving children between the ages of 6 and 12 years using a questionnaire to elicit socio-demographic information on each child. An intra-oral examination was conducted to assess dental caries and oral hygiene status. The data was analyzed using logistic regression and the results showed that 41 (46%) of the 89 school children examined had caries. The second mandibular primary molar being carious was 4 times greater than having a second
maxillary molar carious. The age and oral hygiene status had significant impact on the dmft. The study also concluded that there is no significant age related caries distribution pattern in Nigerian school children. The second primary molars appear to be more susceptible to caries in school children in Nigeria.

**Pandit Kusum. et al., (2006)** conducted a study on prevalence of dental caries and associated teeth cleaning habits among school children in four primary schools of Mehrauli block of rural Delhi. Four hundred and fifty eight primary school children of both sexes in the age group of 5–14+ were medically examined in daylight using a mouth mirror and probe. The children came from low socioeconomic backgrounds. Presence of clinical caries was recorded by naked eye examination. Dental caries prevalence was 33.19% and DMF index was 0.52. Teeth cleaning habits of the school children in terms of regularity and associated caries prevalence was also noted. The ‘Regular’ teeth cleaning group showed significantly less caries prevalence while ‘Not Regular’ and ‘Never Cleaning’ groups had higher caries prevalence. Since childhood is such an impressionable age all students were made aware of the need for proper oral hygiene to minimize the incidence of caries among them.

**Ashok.K.et.al.,(2005)** conducted a study to determine the sugar consumption pattern of the school children in Belgaum city, Karnataka and to organize for a diet-counseling program. 342 school children aged 9 years, from four schools in Belgaum city participated in the study. The pattern of sugar consumption was assessed using a 4-day diet diary. Analysis was done according to the method described by Nizel and Papas (Nutrition in clinical dentistry, 1989, 277) and the variables were: the sweet score, at meal sugar exposure (AMSE), between meal sugar exposure (BMSE) and Total sugar exposure (TSE). Student's t-test was used to statistically analyze the gender difference. The mean + SD of the recorded variables were: sweet score 31 + 12.78/day, AMSE 0.88 + 0.33/day, BMSE 3.95 + 0.87/day, and TSE 4.83 + 0.96/day. No statistical significant gender difference with respect to the variables was observed. 'Tell Show And Do' Diet counseling session will perhaps have a
greater impact as compared to the most common strategy of simply exhorting the children to eat less sugar.

**Kuriakose S., (2005)** conducted a study to describe the dental health status of 10 year-old schoolchildren in Thiruvananthapuram, Kerala, India and to identify sociodemographic factors, oral health behaviours, attitudes and knowledge related to dental caries experience. The study took the form of a cross-sectional survey of 838 children in upper primary schools. A two-stage cluster sampling technique was used. Dental caries was measured using World Health Organization criteria. Socio-demographic factors, oral health behaviours, attitudes and knowledge were assessed by a self-administered questionnaire. The prevalence of dental caries in the permanent dentition was 27%. The mean number of decayed, missing and filled teeth was 0.5 (SD=0.9). The decayed component (D) constituted 91% of the total number of decayed, missing and filled teeth (DMFT). Multiple logistic regression analysis showed that children had a higher risk of having dental caries if they lived in urban area [OR=1.5, 95% confidence interval (CI)=1.1-2.1], had visited a dentist (OR=1.6, 95% CI=1.2-2.2), did not use a toothbrush (OR=1.9, 95% CI=1.2-2.9), consumed sweets (OR=1.4, 95% CI=1.0-1.9) or performed poorly in school (OR=1.7, 95% CI=1.0-2.3).

**Sutthavong Sirikarn et al., (2005)** conducted a cross sectional study among children attending public education centers in Thailand to identify prevalence and severity of dental caries and their risk factors. There were 157 (99.4%) from 158 children aged 2-12 years participated in the survey, 152 (96.8%) students had dental caries. The prevalence of dental caries among pre-school children was 95.4%. The overall average Decay Missing Filling for primary teeth was 7.4 (+ 4.6) and the overall average Decay Missing Filling for permanent teeth was 3.7 (+ 1.8). The decayed missing filled tooth among pre-school children was 9.1 (+ 5.2). The prevalence of gingivitis was 95.5%. The independence risk factors for dental caries for primary teeth were brushing under supervision of teacher when compared with the parents (Odds ratio =
12.1 (95% CI, 2.6-55.4)), and not brushing after breakfast (Odds ratio = 3.7 (95% CI, 1.1-12.1).There were no significant risk factors of dental caries for permanent teeth.

**Mahes kumar.et.al.,(2003)** conducted a study to assess the oral health status of 5-12 years school going children in Chennai city. The study population consisted of 1200 school children of both sexes in 30 schools, which had been selected randomly. The survey is based on WHO 1999 oral health assessment. In 5 year boys Decayed Missed Filled Teeth was 3.53 +/- 3.07, girls was 3.49 +/- 2.83. In 12 year the Decayed filled missed filled teeth for boys was 3.80 +/- 3.43, girl’s 4.11 +/- 2.93. Caries prevalence high in 12 year age group. Correlation (r=0.853) between oral hygiene index score with dental caries for 5 years showed that boys had a high oral hygiene index score with increased caries rate when compared to girls. There is statistically significant difference in the economic status between corporation and private school children (p<0.001). Evaluation of the oral health status of these children revealed, dental caries is most prevalent disease affecting permanent teeth, more than primary teeth and more in corporation than in private school.

**Section C: studies related to role of nurse in prevention of dental caries.**

**Edith.,(2011)** conducted a study to assess the effectiveness of planned teaching programme on knowledge, attitude and practice of oral hygiene among the primary school children in Mumbai. 120 primary school children were selected by using the non probability purposive technique. Structured teaching programme was conducted after the pre test assessment. Knowledge, attitude and practice were assessed before and after the teaching programme. Pre test results showed that 65% had no knowledge regarding oral hygiene, attitude level was 73.3% and practice level was lower that was 37.2%. The post test results showed that knowledge level increased to 68.3%, practice level was 94.1% and practice level was 80.8%.
Kanmani B., (2010) conducted a study to determine the effectiveness of oral care among children in Kancheepuram, Tamilnadu. Quasi experimental design type was chosen for the study. 182 school children were selected by using convenience sampling technique. Structured questionnaire was used to assess the knowledge and attitude. Checklist was used to assess the practice regarding oral care. The pre test shows that 86% of school children had inadequate knowledge, 90% had unfavorable attitude and 88% had fair practice regarding oral care. The post test results shows that 92% had adequate knowledge, 54% had most favorable attitude and 94% had fair practice regarding oral care.

Harikiram AG., (2000) conducted a study to assess the knowledge, attitude and practice toward oral health among 10-12 years old school children in government aided missionary school of Bangalore city. 212 children were selected by using random sampling technique. Dental examination and interview were conducted. This survey found that only 38.5% of the children brush their teeth two or more times a day. Pain and discomfort from teeth (38.5%) were common while dental visits were infrequent. Fear of the dentist was the main cause of irregular visit in 46.1% of study participants. At the end of the study teaching programme were conducted to promote oral health of school children.
CHAPTER-III
METHODOLOGY

In this chapter methodology includes research approach and design of the study, setting of the study, population, criteria for sample selection, sample size, sampling technique, instrument and scoring procedure, developing and testing of the tool, data collection procedure and plan for analysis.

Research approach:
Descriptive approach was used to conduct the study.

Research design:
Descriptive correlational design was adopted which is one of the non experimental designs.

Setting of the study:
The study was conducted in 13 co-education schools. It includes 3 Government middle schools, 1 Government primary school, 1 Government aided middle school and 8 Government aided primary schools at Dharapuram. Total numbers of students in 13 schools were 2000. These schools are situated around 5 km from college campus.

Population:
The population selected for this study was the school age children.

Sample:
The school children who are studying in 1st to 5th standard between the age group of 6-10 years are the samples of the study.

Criteria for sample selection:
1. Inclusion criteria:
   - Age group between 6-10 years children
   - Both boys and girls
2. **Exclusion criteria:**
   - The students who were absent during the data collection period

**Sample size:**

The sample size was 870, out of which 548 children had dental caries.

**Sampling technique:**

The samples were selected by using non probability convenience sampling technique.

**Instrument:**

**Description of the tool:**

**PART-I**

It consists of demographic variables such as age, sex, religion, area of residence, education of the child, type of family, monthly income of the family and family history of dental caries.

**PART-II**

It consists of International Caries Detection Assessment System description and scores (ICDAS foundation, 2008) used to assess the dental caries. Total score was 6.

**PART-III**

It consists of 3 point rating scale to assess the risk factors of dental caries. It consists of 24 questions among which 11 questions are related to food factors and 13 questions are related to oral hygiene. It has 11 positive questions and 13 negative questions. Total score was 72.

**Scoring procedure and interpretation:**

**PART-I**

It consists of demographic variables.
PART-II

ICDAS (2008) scores are interpreted as follows.

<table>
<thead>
<tr>
<th>Lay term</th>
<th>Dental term</th>
<th>Score</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sound</td>
<td>Sound</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Early stage decay</td>
<td>First visual changes in enamel</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Distinct visual change in enamel</td>
<td>2</td>
<td>33</td>
</tr>
<tr>
<td>Established decay</td>
<td>Localized enamel breakdown</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Underline dentin shadow</td>
<td>4</td>
<td>67</td>
</tr>
<tr>
<td>Severe decay</td>
<td>Distinct cavity with visible dentin</td>
<td>5</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Extensive cavity with visible dentin</td>
<td>6</td>
<td>100</td>
</tr>
</tbody>
</table>

PART-III

3 point rating scale was used to assess the risk factors of dental caries. It consists of 24 items in which 11 positive questions and 13 negative questions are there. Scoring for positive questions;

Never -1, Occasionally -2, Frequently -3

Scoring for negative questions;

Never -3, Occasionally -2, Frequently -1

Total score: 72, for food factor: 33 and oral hygiene factor: 39

It was interpreted as follows,
<table>
<thead>
<tr>
<th>Level of risk factor</th>
<th>Score</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk factor</td>
<td>55-72</td>
<td>76-100</td>
</tr>
<tr>
<td>Moderate risk factor</td>
<td>38-54</td>
<td>59-75</td>
</tr>
<tr>
<td>High risk factor</td>
<td>1-37</td>
<td>1-58</td>
</tr>
</tbody>
</table>

**Validity:**

The validity of the tool was established in consultation with one dentist, one pediatrician and 4 nursing experts in the field of child health nursing. No modifications were done.

**Reliability:**

The reliability of the rating scale regarding selected risk factors of dental caries was assessed by internal consistency and stability. Internal consistency was assessed by using split half technique where Spearman’s Brown Prophecy formula was used. It was found to be reliable. (r=0.94). Stability of the rating scale was assessed by using test retest method where Karl Pearson’s formula was used (r=0.92). Reliability of the International caries detection and assessment system (ICDAS) was assessed by equivalence. Equivalence was assessed by inter rater method where Karl Pearson formula was used. It was found to be reliable (r=0.93).

**Pilot study**

Pilot study was conducted in Government Primary school, Manakadavu. The investigator has obtained formal permission from District Education Officer. The verbal consent was obtained from the head master of the school and each school age children studying in 1st - 5th standard. The samples were selected by non probability convenience sampling technique who met the inclusion criteria. Demographic data was collected and selected risk factors of dental caries were assessed by using rating scale. Tooth examination for caries detection was done by using International Caries Detection and Assessment System (2008). 9-10 minutes were spent for each sample. The sample size was
70, out of which 34 children are affected with dental caries. The results were computed and tabulated by using descriptive and inferential statistics. The results of the pilot study showed that 48.5% of the school age children are affected with dental caries, 51.4% had sound teeth, 25.7% had severe decay and 72.85% of the school age children had moderate risk factors. There was a significant positive correlation between the selected risk factors and level of dental caries ($r=0.6$). The practicality and feasibility of the tool was established by pilot study and major study was preceded.

**Data collection procedure:**

The major study was conducted in primary schools of Government and Government aided Schools at Dharapuram. The data collection was done for the period of five weeks. Written permission was obtained from the district educational officer. The verbal consent was obtained from the school head masters and each school age children aged between 6-10 years. The samples were selected by using non probability convenience sampling technique who met the inclusion criteria. Demographic data were collected. The rating scale was used to assess the selected risk factors of dental caries and level of dental caries was assessed by international caries assessment system (2008). 9-10 minutes were spent for each sample. 40-45 samples were assessed per day. At the end of the data collection dental caries prevalence rate was 548 out of 870 school age children. After the data collection the self instructional module on prevention of dental caries was distributed to study samples. Severe cases were instructed to go for further treatment of dental caries. Collected data were tabulated and analyzed by using SPSS (16.0) version.
Plan for data analysis:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Data analysis</th>
<th>Methods</th>
<th>Objectives and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Descriptive analysis</td>
<td>Frequency percentage, Mean,</td>
<td>To describe demographic variables among affected school age children.</td>
</tr>
<tr>
<td></td>
<td>(SPSS package 16.0 version)</td>
<td>Standard deviation</td>
<td>To assess the selected risk factors of dental caries and level of dental caries among school age children.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Inferential statistics</td>
<td>Correlation coefficient (Karl pearson)</td>
<td>To correlate the selected risk factors and level of dental caries among affected school age children.</td>
</tr>
<tr>
<td></td>
<td>(SPSS package 16.0 version)</td>
<td>‘z’ score</td>
<td>To compare the selected risk factors of dental caries between affected and unaffected school age children.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Logistic regression analysis</td>
<td></td>
<td>To find the impact of risk factors on dental caries among school age children.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chi-square</td>
<td></td>
<td>To find association of the selected risk factors of dental caries among affected school age children with their selected demographic variables.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>To find association of the level of dental caries among affected school age children with their selected demographic variables.</td>
</tr>
</tbody>
</table>

Protection of human subjects:

The research proposal was approved by the dissertation committee. The written consent was obtained from the District Educational Officer and verbal consent from school head masters and each school age children was obtained by explaining the purpose of the study.
CHAPTER - IV
DATA ANALYSIS AND INTERPRETATION

This chapter deals with the analysis and interpretation of the data collected to correlate the selected risk factors of dental caries and level of dental caries among school age children in government and government aided schools at Dharapuram.

Data were collected from government and government aided schools at Dharapuram by using International Caries Detection and Assessment System scores and three point rating scale. The collected data were coded and analyzed as per objectives by using SPSS (16.0 version) statistical package.

ORGANIZATION OF DATA:
The data has been organized and tabulated as follows,

Section A Assess the prevalence of dental caries among school age children.
Section B Distribution of demographic variables among affected school age children.
Section C Assess the level of dental caries among school age children.
Section D Assess the selected risk factors of dental caries among school age children.
Section E Correlation between the selected risk factors and level of dental caries among affected school age children.
Section F Comparison between the selected risk factors of dental caries between affected and unaffected school age children.
Section G Find the impact of risk factors on dental caries among school age children.
Section H Association of the selected risk factors of dental caries among affected children with their selected demographic variables.
Section I Association of the level of dental caries among affected school age children with their selected demographic variables.
SECTION A: ASSESS THE PREVALENCE OF DENTAL CARIES AMONG SCHOOL AGE CHILDREN.

TABLE: 1 Frequency and percentage distribution of school age children according to the prevalence of dental caries.  

<table>
<thead>
<tr>
<th>Prevalence of dental caries</th>
<th>Frequency (F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affected children</td>
<td>548</td>
<td>63</td>
</tr>
<tr>
<td>Unaffected children</td>
<td>322</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>100</td>
</tr>
</tbody>
</table>

Table: 1 depicts that 548 (63%) school age children had dental caries and 322 (37%) school age children had no dental caries.
PREVALENCE OF DENTAL CARIES

Figure: 4 Percentage distribution of school age children according to the prevalence of dental caries.
SECTION B: DISTRIBUTION OF DEMOGRAPHIC VARIABLES AMONG AFFECTED SCHOOL AGE CHILDREN

TABLE 2 Frequency and percentage distribution of demographic variables among affected school age children.

n=548

<table>
<thead>
<tr>
<th>S.No</th>
<th>Demographic variables</th>
<th>Frequency (F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Age of the child</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) 6-7 Years</td>
<td>169</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>b) 8-9 Years</td>
<td>237</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>c) 10 Years</td>
<td>142</td>
<td>26</td>
</tr>
<tr>
<td>2.</td>
<td>Sex of the child</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Male</td>
<td>271</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>b) Female</td>
<td>277</td>
<td>51</td>
</tr>
<tr>
<td>3.</td>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Hindu</td>
<td>383</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>b) Muslim</td>
<td>130</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>c) Christian</td>
<td>35</td>
<td>6</td>
</tr>
<tr>
<td>4.</td>
<td>Area of residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Rural</td>
<td>41</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>b) Urban</td>
<td>507</td>
<td>93</td>
</tr>
<tr>
<td>5.</td>
<td>Education of the mother</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) No formal education</td>
<td>140</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>b) Primary education</td>
<td>315</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>c) Higher secondary education</td>
<td>75</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Graduate and above</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>Type of family</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Nuclear family</td>
<td>340</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>b) Joint family</td>
<td>208</td>
<td>38</td>
</tr>
</tbody>
</table>
7. Monthly income of the family
   a) Rs.2000-3000  |  68  |  12
   b) Rs.3001-4000 | 152  |  28
   c) Rs.4001-5000 | 230  |  42
   d) Above Rs.5000|  98  |  18

8. Family history of dental caries
   a) Yes         | 212  |  39
   b) No          | 258  |  47
   c) Don’t know  |  78  |  14

| Table: 2 depicts that distribution of demographic variables among affected school age children. |

Regarding age of the child, majority 237 (43%) of school age children belonged to age group of 8-9 years, 169 (31%) belonged to age group of 6-7 years and 142 (26%) belonged to age group of 10 years. (fig: 5)

According to their sex, majority 277 (51%) of school age children were female and 271 (49%) were male. (fig: 6)

Regarding religion, majority 383 (70%) of school age children were Hindus, 130 (24%) were Muslims and 35 (6%) were Christians. (fig: 7)

Regarding area of residence, majority 507 (93%) of school age children were from urban and 41 (7%) were from rural area. (fig: 8)

Regarding education of the mother, majority 315 (58%) of the mothers had primary education, 140 (25%) had no formal education, 75 (14%) had higher secondary education and 18 (3%) were graduate and above. (fig: 9)

Regarding type of family, majority 340 (62%) of school age children belonged to nuclear family and 208 (38%) belonged to joint family. (fig:10)
Regarding monthly income of the family, majority 230 (42%) of school age children had the family income between Rs.4001-5000, 152 (28%) had the family income between Rs.3001-4000, 98 (18%) had the family income of above Rs. 5000 and 68 (12%) had the family income between Rs.2000-3000. (fig: 11)

Regarding family history of dental caries, majority 258 (47%) of school age children did not have family history of dental caries, 212 (39%) had the family history of dental caries and 78 (14%) of school age children did not know about the family history of dental caries. (fig: 12)
AGE OF THE CHILD

Figure: 5 Percentage distribution of the affected school age children according to their age.
SEX

Figure: 6 Percentage distribution of the affected school age children according to their sex.
Figure 7: Percentage distribution of the affected school age children according to their religion.
AREA OF RESIDENCE

Figure: 8 Percentage distribution of the affected school age children according to their area of residence.
EDUCATION OF THE MOTHER

Figure: 9 Percentage distribution of the affected school age children according to their education of the mother.
TYPE OF FAMILY

Figure: 10 Percentage distribution of the affected school age children according to their type of family.
MONTHLY INCOME OF THE FAMILY

Figure: 11 Percentage distribution of the affected school age children according to their monthly income of the family.
FAMILY HISTORY OF DENTAL CARIES

Figure: 12 Percentage distribution of the affected school age children according to their family history of dental caries
SECTION C: ASSESS THE LEVEL OF DENTAL CARIES AMONG SCHOOL AGE CHILDREN.

TABLE 3 Frequency and percentage distribution of the level of dental caries among school age children.

<table>
<thead>
<tr>
<th>Level of dental caries</th>
<th>Frequency (F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sound</td>
<td>322</td>
<td>37</td>
</tr>
<tr>
<td>Early decay</td>
<td>78</td>
<td>9</td>
</tr>
<tr>
<td>Established decay</td>
<td>152</td>
<td>18</td>
</tr>
<tr>
<td>Severe decay</td>
<td>318</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3 depicts that majority 322 (37%) of the school age children had sound teeth, 318 (36%) had severe decay, 152 (18%) had established decay and 78 (9%) had the early decay.
LEVEL OF DENTAL CARIES

Figure: 13 Percentage distributions of school age children according to their level of dental caries
SECTION D: ASSESS THE SELECTED RISK FACTORS OF DENTAL CARIES AMONG SCHOOL AGE CHILDREN.

TABLE: 4 Frequency and percentage distribution of selected risk factors of caries among school age children.

<table>
<thead>
<tr>
<th>Risk factors (overall)</th>
<th>Frequency (F)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk</td>
<td>128</td>
<td>15</td>
</tr>
<tr>
<td>Moderate risk</td>
<td>576</td>
<td>66</td>
</tr>
<tr>
<td>High risk</td>
<td>166</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>100</td>
</tr>
</tbody>
</table>

n=870

Table: 4 depicts that, 576 (66%) of school age children had moderate risk factors, 166 (19%) had high risk factors and 128 (15%) had low risk factors.
SELECTED RISK FACTORS

Figure: 14 Percentage distributions of selected risk factors of dental caries among school age children.
TABLE: 5  Frequency and percentage distribution of risk factors based on food among school age children.

<table>
<thead>
<tr>
<th>Risk of food factor</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk</td>
<td>171</td>
<td>20</td>
</tr>
<tr>
<td>Moderate risk</td>
<td>505</td>
<td>58</td>
</tr>
<tr>
<td>High risk</td>
<td>194</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>100</td>
</tr>
</tbody>
</table>

Table: 5 depicts that the risk factors based on food, 505 (58%) of school age children had moderate risk, 194 (22%) had high risk and 171 (20%) had low risk factors.
TABLE: 6  Frequency and percentage distribution of risk factors based on the oral hygiene among school age children.

<table>
<thead>
<tr>
<th>Risk of oral hygiene</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk</td>
<td>120</td>
<td>14</td>
</tr>
<tr>
<td>Moderate risk</td>
<td>625</td>
<td>72</td>
</tr>
<tr>
<td>High risk</td>
<td>125</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>870</td>
<td>100</td>
</tr>
</tbody>
</table>

Table: 6 depicts that the risk factors based on oral hygiene, 625 (72%) of school age children had moderate risk, 125 (14%) had high risk and 120 (14%) had low risk factors.
SECTION E:  CORRELATION BETWEEN THE SELECTED RISK FACTORS AND LEVEL OF DENTAL CARIES AMONG AFFECTED SCHOOL AGE CHILDREN.

TABLE: 7 Correlation between the selected risk factors and level of dental caries among affected school age children.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Variable</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Coefficient of correlation</th>
<th>Table value</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Selected risk factors</td>
<td>42.63</td>
<td>6.22</td>
<td>r = -0.211</td>
<td>0.065</td>
<td>S</td>
</tr>
<tr>
<td>2.</td>
<td>Level of dental caries</td>
<td>4.46</td>
<td>1.53</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n=548

Table: 7 depicts that the mean and standard deviation scores for the selected risk factors were 42.63 (SD± 6.22) and the mean and standard deviation scores for the level of dental caries were 4.46 (SD± 1.53) respectively. There was a low negative correlation (r= -0.211) between the selected risk factors and level of dental caries among school age children.

It shows that an inverse relationship between selected risk factors and level of dental caries in which there is a high mean value (42.63) on selected risk factors to be associate with low mean value (4.46) on level of dental caries.
SECTION: F  COMPARISON THE SELECTED RISK FACTORS OF DENTAL CARIES BETWEEN AFFECTED AND UNAFFECTED SCHOOL AGE CHILDREN.

TABLE: 8  Comparison of mean, standard deviation and 'z’ value of selected risk factors of dental caries between affected and unaffected school age children.

Table: 8 depicts that the mean and standard deviation for selected risk factors of dental caries among unaffected and affected children were 50.45 (SD±7.31) and 42.63 (SD±6.22) respectively. The mean difference was 7.82. The Z value was 16.13. There was a significant difference between the selected risk factors of dental caries among unaffected and affected school age children (p<0.05).
SECTION: G  FIND THE IMPACT OF RISK FACTORS AMONG SCHOOL AGE CHILDREN.

Table: 9  Diagnosis statistics of the analysis (Logistic regression).

<table>
<thead>
<tr>
<th>S.NO</th>
<th>STATISTICS</th>
<th>VALUE</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Chi square</td>
<td>236.507</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>2.</td>
<td>Cox &amp; snell R square</td>
<td>0.238</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Nagelkerke R square</td>
<td>0.325</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 9 depicts the impact of risk factors on dental caries among school age children which is estimated by logistic regression analysis. The results of the analysis are as follows; the selected risk factors are highly significant with dental caries of the school age children ($\chi^2=236.507$). It indicates that the model chosen for the analysis is appropriate. The cox & snell and Nagelkerke R square values are 0.238 & 0.325 respectively. It indicates that the variants in the dependent variable (status of dental caries) can explained by the risk factors (food and oral hygiene) can explain 24% to 33%.
Table 10: Classification table for status of dental caries.

<table>
<thead>
<tr>
<th>Observed Status of dental caries</th>
<th>Predicted</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unaffected</td>
<td>Affected</td>
</tr>
<tr>
<td>Unaffected</td>
<td>183</td>
<td>139</td>
</tr>
<tr>
<td>Affected</td>
<td>76</td>
<td>472</td>
</tr>
<tr>
<td>Overall percentage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10 depicts that the prediction of dental caries among school age children based on the risk factors. The logistic model correctly predicts that 56.8% of the school age children are not affected by the dental caries and 86.1% of the school age children are affected by the dental caries. The model predicts the affected and unaffected school age children by the dental caries (75.3%).
Table 11  Estimated values of the risk factors on dental caries and their interaction by logistic regression.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Co-efficient</th>
<th>Standard error</th>
<th>P value</th>
<th>Exp (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>8.179</td>
<td>0.612</td>
<td>&lt;0.510</td>
<td>3563.597</td>
</tr>
<tr>
<td>Food</td>
<td>-0.215</td>
<td>0.023</td>
<td>&lt;0.570</td>
<td>0.807*</td>
</tr>
<tr>
<td>Oral hygiene</td>
<td>-0.120</td>
<td>0.021</td>
<td>&lt;0.203</td>
<td>0.887*</td>
</tr>
<tr>
<td>Food &amp; oral hygiene</td>
<td>-0.012</td>
<td>0.005</td>
<td>&lt;0.019</td>
<td>0.988*</td>
</tr>
</tbody>
</table>

*- significant.

Table 11 depicts that the $\beta$ coefficient and standard error of risk factors based on food were $\beta = -0.215$ (SE=0.023) and exponential B value was 0.807 which was significant at the level of p<0.570. $\beta$ coefficient and standard error of risk factors based on oral hygiene were $\beta = -0.120$ (SE=0.021) and exponential B value was 0.887 which was significant at the level of p<0.203. $\beta$ coefficient and standard error of both risk factors based on food and oral hygiene were $\beta = -0.012$ (SE=0.005) and exponential B value was 0.988 which was significant at the level of p<0.019.

The exponential B value of $\beta$ coefficient of risk factors based on food, oral hygiene and both food and oral hygiene were 0.807, 0.887 and 0.988 which are less than 1. It indicates one unit increases in the risk factors of food and oral hygiene will minimize the chance of having dental caries among school age children.
SECTION: H ASSOCIATION OF SELECTED RISK FACTORS OF DENTAL CARIES AMONG AFFECTED SCHOOL AGE CHILDREN WITH THEIR SELECTED DEMOGRAPHIC VARIABLES.

TABLE: 12 Association of selected risk factors of dental caries among affected school age children with their selected demographic variables.

<table>
<thead>
<tr>
<th>S. no</th>
<th>Demographic variables</th>
<th>Selected risk factors</th>
<th>( \chi^2 )</th>
<th>Table value</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low risk</td>
<td>Moderate risk</td>
<td>High risk</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>1.</td>
<td>Age of the child</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) 6-7 Years</td>
<td>8</td>
<td>1.5</td>
<td>97</td>
<td>17.7</td>
</tr>
<tr>
<td></td>
<td>b) 8-9 Years</td>
<td>4</td>
<td>0.8</td>
<td>183</td>
<td>33.4</td>
</tr>
<tr>
<td></td>
<td>c) 10 Years</td>
<td>7</td>
<td>1.2</td>
<td>105</td>
<td>19.2</td>
</tr>
<tr>
<td>2.</td>
<td>Sex of the child</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Male</td>
<td>9</td>
<td>1.6</td>
<td>197</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>b) Female</td>
<td>10</td>
<td>1.8</td>
<td>188</td>
<td>34.3</td>
</tr>
<tr>
<td>3.</td>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Hindu</td>
<td>16</td>
<td>2.9</td>
<td>257</td>
<td>46.9</td>
</tr>
<tr>
<td></td>
<td>b) Muslim</td>
<td>1</td>
<td>0.2</td>
<td>102</td>
<td>18.6</td>
</tr>
<tr>
<td></td>
<td>c) Christian</td>
<td>2</td>
<td>0.4</td>
<td>26</td>
<td>4.7</td>
</tr>
<tr>
<td>4.</td>
<td>Area of residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Rural</td>
<td>1</td>
<td>0.2</td>
<td>37</td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td>b) Urban</td>
<td>18</td>
<td>3.3</td>
<td>348</td>
<td>63.5</td>
</tr>
</tbody>
</table>

n=548
<table>
<thead>
<tr>
<th></th>
<th>Education of the mother</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a) Illiterate</td>
<td>5</td>
<td>0.9</td>
<td>96</td>
<td>17.5</td>
<td>39</td>
<td>7.1</td>
<td>10.09</td>
</tr>
<tr>
<td></td>
<td>b) Primary education</td>
<td>12</td>
<td>2.2</td>
<td>212</td>
<td>38.7</td>
<td>91</td>
<td>16.6</td>
<td>(df=6)</td>
</tr>
<tr>
<td></td>
<td>c) Secondary education</td>
<td>2</td>
<td>0.4</td>
<td>60</td>
<td>10.9</td>
<td>13</td>
<td>2.4</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>d) Graduate and above</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td>3.1</td>
<td>1</td>
<td>0.2</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Type of family</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a) Nuclear family</td>
<td>12</td>
<td>2.2</td>
<td>234</td>
<td>42.7</td>
<td>94</td>
<td>17.1</td>
<td>0.911</td>
</tr>
<tr>
<td></td>
<td>b) Joint family</td>
<td>7</td>
<td>1.3</td>
<td>151</td>
<td>26.1</td>
<td>50</td>
<td>10.6</td>
<td>(df=2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Monthly income of the family</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a) Rs.2000-3000</td>
<td>2</td>
<td>0.4</td>
<td>47</td>
<td>8.6</td>
<td>19</td>
<td>3.5</td>
<td>9.462</td>
</tr>
<tr>
<td></td>
<td>b) Rs.3001-4000</td>
<td>8</td>
<td>1.5</td>
<td>108</td>
<td>19.7</td>
<td>36</td>
<td>6.6</td>
<td>(df=6)</td>
</tr>
<tr>
<td></td>
<td>c) Rs.4001-5000</td>
<td>6</td>
<td>1.1</td>
<td>152</td>
<td>27.7</td>
<td>72</td>
<td>13.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Above Rs .5000</td>
<td>3</td>
<td>0.5</td>
<td>78</td>
<td>14.2</td>
<td>17</td>
<td>3.1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Family history of dental caries</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a) Yes</td>
<td>7</td>
<td>1.3</td>
<td>140</td>
<td>25.5</td>
<td>65</td>
<td>11.9</td>
<td>9.49</td>
</tr>
<tr>
<td></td>
<td>b) No</td>
<td>12</td>
<td>2.2</td>
<td>180</td>
<td>32.8</td>
<td>66</td>
<td>12.0</td>
<td>(df=4)</td>
</tr>
<tr>
<td></td>
<td>c) Don’t know</td>
<td>0</td>
<td>0</td>
<td>65</td>
<td>11.9</td>
<td>13</td>
<td>2.4</td>
<td></td>
</tr>
</tbody>
</table>

NS- non significant, S -significant p<0.05

Table: 12 depicts that the chi-square values were calculated to find the association of the selected risk factors of dental caries among affected school age children with their selected demographic variables. The results revealed that there was no significant association of selected risk factors of dental caries with their selected demographic variables except for age of the child ($\chi^2=22.205$), area of residence ($\chi^2=8.718$) and family history of dental caries ($\chi^2=10.548$).
SECTION I: ASSOCIATION OF THE LEVEL OF DENTAL CARIES AMONG AFFECTED SCHOOL AGE CHILDREN WITH THEIR SELECTED DEMOGRAPHIC VARIABLES.

TABLE: 13 Association of the level of dental caries among affected school age children with their selected demographic variables.

<table>
<thead>
<tr>
<th>S. no</th>
<th>Demographic variables</th>
<th>Level of dental caries</th>
<th>( \chi^2 )</th>
<th>Table value</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Early decay</td>
<td>Established decay</td>
<td>Severe decay</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>1.</td>
<td>Age of the child</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) 6-7 Years</td>
<td>31</td>
<td>5.6</td>
<td>48</td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) 8-9 Years</td>
<td>25</td>
<td>4.6</td>
<td>74</td>
<td>13.5</td>
</tr>
<tr>
<td></td>
<td>c) 10 Years</td>
<td>22</td>
<td>4.0</td>
<td>30</td>
<td>5.5</td>
</tr>
<tr>
<td>2.</td>
<td>Sex of the child</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) male</td>
<td>35</td>
<td>6.4</td>
<td>74</td>
<td>13.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) female</td>
<td>43</td>
<td>7.9</td>
<td>78</td>
<td>14.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Hindu</td>
<td>58</td>
<td>10.6</td>
<td>108</td>
<td>19.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Muslim</td>
<td>14</td>
<td>2.5</td>
<td>35</td>
<td>6.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Christian</td>
<td>6</td>
<td>1.1</td>
<td>9</td>
<td>1.6</td>
</tr>
<tr>
<td>4.</td>
<td>Area of residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Rural</td>
<td>8</td>
<td>1.5</td>
<td>14</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Urban</td>
<td>70</td>
<td>12.8</td>
<td>138</td>
<td>25.2</td>
</tr>
</tbody>
</table>

n=548
Table 13 depicts that the chi-square values were calculated to find the association of the level of dental caries among affected school age children with their selected demographic variables. The results revealed that, there was no significant association of the level of dental caries with age of the child, sex, religion, area of residence, education of mother, type of family, family income and family history of dental caries.
CHAPTER -V
DISCUSSION

The discussion chapter deals with description of sample characteristics and objectives of the study. The aim of the present study was to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram.

Distribution of sample characteristics:

- Regarding age of the child, majority 237 (43%) of school age children belonged to age group of 8-9 years, 169 (31%) belonged to age group of 6-7 years and 142 (26%) belonged to age group of 10 years.
- According to their sex, majority 277 (51%) of school age children were female and 271 (49%) were male.
- Regarding religion, majority 383 (70%) of school age children were Hindus, 130 (24%) were Muslims and 35 (6%) were Christians.
- Regarding area of resident, majority 507 (93%) of school age children were from urban and 41 (7%) were from rural.
- Regarding education of the mother, majority 315 (58%) of the mothers had primary education, 140 (25%) had no formal education, 75 (14%) had higher secondary education and 18 (3%) were graduate and above.
- Regarding type of family, majority 340 (62%) of school age children belonged to nuclear family and 208 (38%) belonged to joint family.
- Regarding monthly income of the family, majority 230 (42%) of school age children had the family income of Rs.4001-5000, 152 (28%) had the family income of Rs.3001-4000, 98 (18%) had the family income of above 5000 Rs and 68 (12%) had the family income of Rs.2000-3000.
Regarding family history of dental caries, majority 258 (47%) of school age children did not have family history of dental caries, 212 (39%) had the family history of dental caries and 78 (14%) of school age children did not know about the family history of dental caries.

The findings of the study are discussed according to the objectives as follows.

1. To assess the prevalence of dental caries among school age children.
2. To assess the level of dental caries among school age children.
3. To assess the selected risk factors of dental caries among school age children.
4. To correlate the selected risk factors and level of dental caries among affected school age children.
5. To compare the selected risk factors of dental caries between affected and unaffected school age children.
6. To find the impact of risk factors on dental caries among school age children.
7. To find association of the selected risk factors of dental caries among affected school age children with their selected demographic variables.
8. To find association of the level of dental caries among affected school age children with their selected demographic variables.

**FIRST OBJECTIVE:**

To assess the prevalence of dental caries among school age children.

The data analysis showed that 548 (63%) of school age children had dental caries and 322 (37%) of school age children had no dental caries.

The study findings are consistent with the findings of Joshi et al. (2005) performed a study on prevalence of dental caries among school children in Kulasekaram, Kanyakumari district, Tamil Nadu. A total of 150 children in the age group of 6-12 years with an equal distribution of 75 boys and 75 girls were included in the study. Out of the total population, 77% of the children were affected by dental caries.
SECOND OBJECTIVE:

To assess the level of dental caries among school age children.

The data analysis showed that, 322 (37%) of school age children had sound teeth, 318 (36%) had severe decay, 152 (18%) had established decay and 78 (9%) had early decay.

The study findings consistent with the findings of Martignon et al. (2005) performed a study to determine the dental caries status in 10 year old children in state of Huila, Colombia. The level of dental caries was assessed by ICDAS. The dental caries scoring categories are score 1-0.9%; score 2-15.5%; score 3-61.8%; score 4-16.4%; score 5-3.6%; score 6-1.8%. All children are affected with dental caries.

THIRD OBJECTIVE:

To assess the selected risk factors of dental caries among school age children.

The data analysis showed that selected risk factors of dental caries, 576 (66%) of school age children were at moderate risk, 166 (19%) and had high risk factors and 128 (15%) had low risk factors.

505 (58%) of school age children had moderate risk factors based on dietary factors, 194 (22%) had high risk group and 171 (20%) had low risk factors.

625 (72%) of school age children had moderate risk factors based on oral hygiene, 125 (14%) had high risk factors, and 120 (14%) had low risk factors.

The study results were consistent with the findings of Wang J. David et al. (2005) performed a cross sectional study to describe the dental health status of 10-year-old schoolchildren in, Kerala, India. Multiple logistic regression analysis showed that children had a higher risk of having dental caries if they lived in urban area [OR = 1.5, 95% confidence interval (CI) = 1.1–2.1], did not
use a toothbrush (OR = 1.9, 95% CI = 1.2–2.9), consumed sweets (OR = 1.4, 95% CI = 1.0–1.9) or performed poorly in school (OR = 1.7, 95% CI = 1.0–2.3).

FOURTH OBJECTIVE:

To correlate the selected risk factors and level of dental caries among affected school age children.

The data analysis showed that there was a negative correlation (r = -0.211) between the selected risk factors and level of dental caries among affected school age children.

The study findings were consistent with the findings of Mahes kumar.et.al.,(2003) performed to assess the oral health status of 5-12 years school going children in Chennai city. Correlation between oral hygiene index score and dental caries was 0.853. There is a statistical significant difference in the economic status between corporation and private school children (p<0.001).

Hence the research hypothesis $H_1$: There will be a significant correlation between the selected risk factors and level of dental caries was accepted.

FIFTH OBJECTIVE:

To compare the selected risk factors between affected and unaffected school age children.

The data analysis showed that among 870 school age children the mean and standard deviation for selected risk factors among affected and unaffected school age children were 42.63 (SD±6.22) and 50.45 (SD±7.31) respectively. The Z value of selected risk factor was 16.13, which was significant at p< 0.05 level, which denotes that there was a significant difference between the mean values of affected and unaffected school age children.
SIXTH OBJECTIVE:
To find the impact of risk factors on dental caries among school age children

The $\beta$ coefficient and standard error of risk factors based on food were $\beta = -0.215$ (SE=0.023) and exponential $B$ value was 0.807 which was significant at the level of $p<0.570$. $\beta$ coefficient and standard error of risk factors based on oral hygiene were $\beta = -0.120$ (SE=0.021) and exponential $B$ value was 0.887 which was significant at the level of $p<0.203$. $\beta$ coefficient and standard error of both risk factors based on food and oral hygiene were $\beta = -0.012$ (SE=0.005) and exponential $B$ value was 0.988 which was significant at the level of $p<0.019$.

The exponential $B$ value of $\beta$ coefficient of risk factors based on food, oral hygiene and both food and oral hygiene were 0.807, 0.887 and 0.988 which are less than 1. It indicates one unit increases in the risk factors of food and oral hygiene will minimize the chance of having dental caries among school age children.

SEVENTH OBJECTIVE:
To find association of the selected risk factors of dental caries among affected school age children with their selected demographic variables.

The data analysis showed that chi-square values were calculated to find the association of the selected risk factors of dental caries among affected school age children with their selected demographic variables. There was no significant association of selected risk factors of dental caries with their selected demographic variables except for age of the child ($\chi^2=22.205$), area of residence ($\chi^2=8.718$) and family history of dental caries ($\chi^2=10.548$).

Hence the research hypothesis $H_2$ :There will be a significant association between selected risk factors of dental caries among affected school age children with their selected demographic variables was rejected except for age of the child, area of resident and family history of dental caries.
EIGHTH OBJECTIVE:
To find the association of the level of dental caries among affected school age children with their selected demographic variables.

The data analysis showed that the chi-square values were calculated to find the association of the level of dental caries among affected school age children with their selected demographic variables. There was no significant association with age of the child, sex, religion, resident, and education of mother, type of family, family income and family history of dental caries.

This study finding were consistent with the findings of Thomas.P.Shija., (2010) regarding dental caries and oral health practices among school children in selected schools in Palakkad District, Karela. There was no significant association between dental caries and age, sex, education of mother, occupation of mother, family income and decayed tooth in family members (p>0.05).

Hence the research hypothesis $H_3$: There will be a significant association between the level of dental caries among affected school age children with their selected demographic variables was rejected.
This chapter deals with:

1. Summary of the study
2. Conclusion
3. Implications for nursing
4. Recommendations
5. Limitations

SUMMARY OF THE STUDY

The present study was done to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram.

The research approach used for the study was descriptive approach. The research design used for the study was descriptive correlational design. Conceptual framework adopted in the present study was the modified Dorothea E. Orem self care deficit theory of nursing (2001). The samples were selected by non probability convenience sampling technique. The investigator gave the brief introduction to the school age children.

Dental caries was assessed by using international caries detection assessment system (ICDAS foundation, 2008). Risk factors were assessed by using rating scale. 9-10 minutes was spent for each sample. 40-45 samples were assessed per day. After the data collection the prevalence of dental caries was 548 out 870 among school age children. At the end of data collection self instructional module regarding prevention of dental caries was distributed to the study samples. Severe cases were instructed to go for further treatment of dental caries. The collected data were analyzed and tabulated by using descriptive and inferential statistics (SPSS 16.0 version).
MAJOR FINDINGS OF THE STUDY:

- Regarding age, majority 237 (43%) of school age children belonged to age group of 8-9 years.
- According to their sex majority 277 (51%) of school age children were female.
- Regarding religion, majority 383 (70%) of the school age children were Hindus.
- Regarding area of residence, majority 507 (93%) of the school age children were from urban area.
- Regarding education of the mother, majority 315 (58%) of the mother had primary education.
- Regarding type of family, majority 340 (62%) of the school age children belonged to nuclear family.
- Regarding monthly income of the family, majority 230 (42%) of the school age children had family income between Rs.4001-5000.
- Regarding family history of dental caries, majority 258 (47%) of the school children did not have the family history of dental caries.
- The data analysis depicts that majority 548 (63%) of the school age children had dental caries.
- Higher percentages 322 (37%) of school age children had sound teeth, and 318 (36%) had severe decay.
- Higher percentages 505 (58%) of school age children had moderate risk factors based on food
- Higher percentages 625 (72%) of school age children had moderate risk factors based on oral hygiene.
- Higher percentages 576 (66%) of school age children had moderate risk factors.
- There is a negative correlation $r=-0.211$ between the selected risk factors and level of dental caries among affected school age children.
• The mean and standard deviation for selected risk factors of dental caries between affected and unaffected school age children were 42.63 (SD±6.22) and 50.45 (SD±7.31) respectively.

• The Z value of selected risk factors was 16.13 which are significant at 0.05 level, which denotes that there is significant difference between the mean values of affected and unaffected school age children

• There was no significant association of selected risk factors of dental caries among affected school age children with their selected demographic variables except for age of the child (χ²=22.205), area of residence (χ²=8.718) and family history of dental caries (χ²=10.548).

• There was no significant association of the level of dental caries among affected school age children with any one of the selected demographic variables.

• The β coefficient and standard error of risk factors based on food were β= -0.215 (SE=0.023) and exponential B value was 0.807 which was significant at the level of p<0.570. β coefficient and standard error of risk factors based on oral hygiene were β= -0.120 (SE=0.021) and exponential B value was 0.887 which was significant at the level of p<0.203. β coefficient and standard error of both risk factors based on food and oral hygiene were β= -0.012 (SE=0.005) and exponential B value was 0.988 which was significant at the level of p<0.019. The exponential B value of β coefficient of risk factors based on food, oral hygiene and both food and oral hygiene were 0.807, 0.887 and 0.988 which are less than 1. It indicates one unit increases in the risk factors of food and oral hygiene will minimize the chance of having dental caries among school age children.
CONCLUSION:

The present study correlated the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram. The study findings revealed that there was a negative correlation $r = -0.211$ between the selected risk factors and level of dental caries among school age children. The risk Z value for selected risk factors was 16.13 which are significant at 0.05 level, which denotes that there was a significant difference between the mean values of affected and unaffected school age children. Logistic regression showed that there was a significant impact of risk factors (Exp B=0.988) on dental caries among school age children. The study findings revealed that adequate food and oral hygiene practices will helps to maintain the good dental health status of school age children.

IMPLICATIONS OF NURSING:

The findings of the study have certain implications for nursing service, education, administration and nursing research.

NURSING SERVICE:

- Paediatric nurses can give education to the school children to practice good oral hygiene when admitted in the hospital.
- School health nurse can conduct dental caries screening programme in various schools and organize the awareness programme.
- Learning Materials like wall hangings, posters charts can be made available in the ward and outpatient departments regarding dental caries and oral hygiene practices in hospitals and community setups.

NURSING EDUCATION:

- Nurse educator can encourage the nursing students to conduct a health education programme in schools regarding the prevention of dental caries and promotion of oral health.
• Nurse educator can organize in service education programme for the teachers regarding monitoring and early detection of dental caries.
• Nurse educator can orient the nursing students with alternative treatment in pain management related to dental caries.
• Nurse educator can conduct the workshop on importance of oral health to nursing students.
• Nurse educator can organize and encourage the nursing students to celebrate the world oral health day and conduct rally to create awareness among general population in clinical and community settings.

NURSING ADMINISTRATION:
• Nurse administrator can organize dental health camp in urban and rural areas especially to cover paediatric population.
• Nurse administrator have more responsibility as supervisors on creating awareness among various age groups regarding dental caries by facilitating free distribution of pamphlets, booklets, handouts and conduct exhibitions using posters, charts regularly in various schools.
• Nurse administrator can organize the in service education programme regarding various cutting edge technological advancement in the treatment of dental caries to all the health care providers which create awareness and helps to provide early care.
• Nurse administrator can conduct mass education programme by using variety of audio visual aids like televisions, computer, puppet shows on prevention of dental caries, which would benefit to school teachers, children and community.

NURSING RESEARCH
• The study findings can be effectively utilised by the emerging nurse researchers to conduct further studies and improving the body of knowledge in nursing.
• Students can do the mini project on other aspects of dental caries such as oral hygiene; periodontal diseases, fluorosis among various age groups.

RECOMMENDATIONS:
1. A longitudinal study can be conducted to assess the progress of dental caries.
2. Comparative study can be conducted between the school age children with dental caries from urban and rural community.
3. This similar study can be conducted on large samples for generalisation of findings.
4. Similar study can be conducted regarding knowledge and practice in terms of prevention of dental caries among school children of different age groups.
5. Study can be conducted regarding assessment of dental caries and oral health practices among mothers of under five children.
6. An experimental study can be conducted among dental caries children by using any nursing intervention.

LIMITATIONS:
The researcher found difficulty to control the school children.
BIBLIOGRAPHY

BOOKS:

JOURNALS:


WEBSITES:

32. www.pubmed dental caries.com
33. http://www.gerkert/iupui.edu
34. http://www.martignonstefania.unbosque.edu.co
APPENDIX – A
2. வகுப்பாளர் சாதனா செயல்பாடு, கோழிக்கோடு


பாரசல்: கோழிக்கோடு - வருகைகள் மற்றும் திருச்செலவுகள் செயல்பாடு - வேறு தொடர்பிலான பின்னர் மற்றும் கூட்டு தொடர்பு - பகுதி செயல்பாடு - அரசு

பாரதாமனம்: பெருமாள் சுருக்கங்கள் கோழிக்கோடு அறிவியல் தொகுதிகள் 26.04.2011

பாரதாமனம் தொடர்பில் காலத்தில் செயல்பாடு மற்றும் கூட்டு தொடர்பிலான

பாரதாமனம் தொடர்பில் காலத்தில் செயல்பாடு மற்றும் கூட்டு தொடர்பிலான

1. எலாக்கு கட்டுப்பாடு மற்றும் கூட்டு தொடர்பில்
2. கட்டுப்பாடு கூட்டு தொடர்பில்

பதிவு: வாகனறிவாள் வேலைவாளியிருக்கிறார்

செயல்: வாகனறிவாள் வேலைவாள் அறிவியல்
APPENDICES – B

LETTER SEEKING EXPERT’S OPINION FOR
VALIDITY OF TOOLS

From

Mrs. T. Praveena
M.Sc. (Nursing) II year,
Bishop’s College of Nursing,
Dharapuram.

To

Respected Madam/Sir,

SUB: Requisition for content validity of tool

I am M.Sc. (Nursing) second year student of Bishop’s College of Nursing, Dharapuram, under Dr. M.G.R Medical University, Chennai. As a partial fulfillment of my M.Sc.(N) Degree Programme, I am conducting a research on “A study to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram with a view to prepare a self instructional module on prevention of dental caries”. One of the initial steps of the research study is to develop a tool. I am sending the above stated for content validity and for your expert and valuable opinion.

I will be very thankful to return it to the undersigned.

Yours sincerely,

(T. Praveena)

Encl;

Certificate of content validity

1. Statement of problem, objectives, operational definition, hypothesis
2. Description of the tool and tool for data collection
3. Self addressed envelope
APPENDIX - C

CHILD HEALTH NURSING

LIST OF EXPERTS OF VALIDATION

1. Dr.Nalini Jeyavanth Santha
   Principal,
   Sacred heart nursing college,
   Madurai.

2. Mrs.Mahalakshmi
   Associate Professor,
   KMCH College of nursing,
   Coimbatore.

3. Mrs.Vijayalakshmi
   Associate Professor,
   KMCH College of nursing,
   Coimbatore.

4. Mrs.Kavimani
   Principal,
   Shivparvathi mandradiar institute of health sciences,
   Palayakottai.

5. Dr.Arivanand, M.B.B.S...M.D.(Ped)
   Maharishi nursing home,
   Dharapuram.

6. Dr.Prabakaran, B.D.S...
   Asst surgeon (Dental),
   Government hospital,
   Dharapuram.
APPENDIX – D

CERTIFICATE FOR VALIDITY

This is to certify that the rating scale on “A study to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram with a view to prepare a self instructional module on prevention of dental caries” has been validated by me and found appropriate with mentioned suggestions.

Signature : [Signature]

Name : [Name]

Designation : Principal

College : Sacred Heart Nursing College

Madurai

Dr. Nalini Jayavanth Santha
Principal
Sacred Heart Nursing College
M. DURAI 20
CERTIFICATE FOR VALIDITY

This is to certify that the rating scale on “A study to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram with a view to prepare a self instructional module on prevention of dental caries” has been validated by me and found appropriate with mentioned suggestions.

Signature : [Signature]

Name : N.B. MATHIALAKSHMI

Designation : ASSO. PROFESSOR

College : KANCHI COLLEGE OF MEDICAL COLLEGE
CERTIFICATE FOR VALIDITY

This is to certify that the rating scale on “A study to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram with a view to prepare a self instructional module on prevention of dental caries” has been validated by me and found appropriate with mentioned suggestions.

Signature: V. Rajalakshmi

Name: Mrs. V. Vijayalakshmi

Designation: Asst. Professor, Dept. of Child Health

College: College of Dental Sciences and Hospital, Coimbatore - 64
CERTIFICATE FOR VALIDITY

This is to certify that the rating scale on “A study to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram with a view to prepare a self instructional module on prevention of dental caries” has been validated by me and found appropriate with mentioned suggestions.

Signature:  

Name:  

Designation:  
Principal,  
SHIVPARVATHI MANDRADIAR  
INSTITUTE OF HEALTH SCIENCES,  
PALAYAKOTTAI - 638 108  

College:  

CERTIFICATE FOR VALIDITY

This is to certify that the rating scale on “A study to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram with a view to prepare a self instructional module on prevention of dental caries” has been validated by me and found appropriate with mentioned suggestions.

Signature:

Name:

Designation: Dr. D. S. Arivanand, M.B.B.S., M.D.(Ped.),
Registration No. 57647
MAHARISHI NURSING HOME
Near Bus Stand,
DHRAPURAM-638656.

College:
CERTIFICATE FOR VALIDITY

This is to certify that the rating scale on “A study to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram with a view to prepare a self instructional module on prevention of dental caries” has been validated by me and found appropriate with mentioned suggestions.

Signature : [Signature]

Dr. G. PRABAKARAN, B.D.S.
Act. Surgeron (Dental)
Reg No. 1028, Govt. Hospital,
Dharapuram.

Name : [Name]

Dr. G.G. Prabakaran
B.D.S.

Designation : Assistant Surgeon

[Department]

Government Hospital

College : [College]

Dharapuram, 638687

Tirupur District.
APPENDIX - E

CERTIFICATE OF ENGLISH EDITING

TO WHOM SOEVER IT MAY CONCERN

This is to certify that the dissertation work, “a study to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram with a view to prepare a self instructional module on prevention of dental caries,” done by Mrs. T.Praveena II Year M.Sc (Nursing) student of Bishop’s College of Nursing, Dharapuram is edited for English Language appropriateness by Mr.P.Sampath, M.A., M.Ed.,
APPENDIX –F

CERTIFICATE OF TAMIL EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that “A study to correlate the selected risk factors and level of dental caries among school age children in selected schools at Dharapuram with a view to prepare a self instructional module on prevention of dental caries,” done by Mrs. T.Praveena, II Year M.Sc (Nursing) student of Bishop’s College of Nursing, Dharapuram is edited for Tamil Language appropriateness by Mrs.D.Siranjivimary, M.A., M.Ed., M.Phil., (Tamil).

Date : 31.01.2012

Signature,
C.S.I. Girls Higher Secondary School,
Dharapuram - 638 656.
Tirupur Dist.
APPENDIX-G

LIST OF GIVERNMENT AND GOVERNMENT AIDED SCHOOLS
DHARAPURAM

1. C.S.I. PRIMARY SCHOOL
2. VALAYAKARA STREET MIDDLE SCHOOL
3. C.S.I. PRIMARY SCHOOL NANCHAYAMPALAYAM
4. ANTHONIYOR MIDDLE SCHOOL NANCHAYAMPALAYAM
5. CHITHRUTHAMPALAYAM GOVERNMENT MIDDLE SCHOOL
6. SRINIVASA PRIMARY SCHOOL
7. CHELLAMUTHU PRIMARY SCHOOL
8. GOVERNMENT MIDDLE SCHOOL –OPS
9. SRI RANGAYA PRIMARY SCHOOL
10. THIRUGANAM PRIMARY SCHOOL
11. MATHARAZA PRIMAY SCHOOL
12. BALGIVAR PRIMARY SCHOOL
13. ALOYSIUS PRIMAY SCHOOL
APPENDIX-H
TOOLS
DEMOGRAPHIC VARIABLES

1. Age
   a) 6-7 years
   b) 8-9 years
   c) 10 years

2. Sex
   a) Male
   b) Female

3. Religion
   a) Hindu
   b) Muslim
   c) Christian

4. Area of residence
   a) Rural
   b) Urban

5. Education of the mother
   a) No formal education
   b) Primary education
   c) Higher Secondary education
   d) Graduate and above

6. Type of family
   a) Nuclear family
   b) Joint family
7. Monthly income of the family
   a) Rs. 2000-3000
   b) Rs. 3001-4000
   c) Rs. 4001-5000
   d) Above Rs. 5000

8. Family history of dental caries
   a) Yes
   b) No
   c) Don’t know
### RATING SCALE TO ASSESS THE RISK FACTORS OF DENTAL CARIES

<table>
<thead>
<tr>
<th>S.no</th>
<th>Questions</th>
<th>Never</th>
<th>Occasionally</th>
<th>Frequently</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.*</td>
<td><strong>Food:</strong> Do you eat more sweet items?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2*</td>
<td>Do you eat lollypop?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3*</td>
<td>Do you eat sticky chocolates?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4*</td>
<td>Do you eat dry fruits? (dates, dry grapes)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5*</td>
<td>Do you eat ice cream?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6*</td>
<td>Do you have the habit of eating carbohydrate rich snacks in the break times?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7+</td>
<td>Do you eat acid and fiber rich diet? (Apple, orange, pineapple, banana, carrot and cabbage?)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8*</td>
<td>Do you drink cool drinks? (cola, maaza, sprite, slice)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9*</td>
<td>Do you eat chewing gum?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10*</td>
<td>Do you keep the food for longer time in the mouth while eating?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11*</td>
<td>Do you have the habit of eating snacks just before the bed time?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Oral hygiene</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12*</td>
<td>Do you have the habit of eating without brushing?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13+</td>
<td>Do you use tooth brush for brushing?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14*</td>
<td>Do you use the fingers for brushing the teeth?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15*</td>
<td>Do you use the ash or brick powder to brush the teeth?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16+</td>
<td>Do you use neem stick for brushing the teeth?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17+</td>
<td>Do you brush your teeth for two times daily?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Question</td>
<td>Score 1</td>
<td>Score 2</td>
<td>Score 3</td>
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<tr>
<td>-----</td>
<td>--------------------------------------------------------------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>18+</td>
<td>Do you brush your teeth for the minimum of 3 minutes?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19+</td>
<td>Do you concentrate on all the surfaces of the teeth while brushing?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20+</td>
<td>Do you start brushing from the point where the gum and teeth meets?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21+</td>
<td>Do you change the brush every month?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22+</td>
<td>Do you rinse your mouth with plain water after each time you eat?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23+</td>
<td>Do you use salt water to rinse the mouth?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24+</td>
<td>Do you go for dental check up for every 6 months?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scoring for positive questions;

Never   -1, Occasionally -2, Frequently -3

Scoring for negative questions;

Never   -3, Occasionally -2, Frequently -1

Total score: 72, for food factor: 33 and oral hygiene factor: 39
### ANSWER KEY FOR RATING SCALE:

<table>
<thead>
<tr>
<th>Q.no</th>
<th>Never</th>
<th>Occasionally</th>
<th>Frequently</th>
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<td>1.*</td>
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</tr>
<tr>
<td>3.*</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4.*</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5.*</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6.*</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>7.+</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
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<td>Localized enamel breakdown</td>
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<td>Distinct visual changes in enamel</td>
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<td>First visual changes</td>
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- ICDAS foundation (2008)
TAMIL TOOL

Ra FwpG G tptuk;

1. taJ
   m) 6-7 taJ
   M) 8-9 taJ
   ,) 10 taJ

2. ghypdk;;
   m) Mz;
   M) ngz;

3. kjk;;
   m) ,e;J
   M) KJ:yPk;
   ,) fpwp];bad;

4. trpg;gplk;
   m) fpuhkk;
   M) efuk;

5. jhapd; fy;tpj;jFjp
   m) Kiwahd fy;tpawpT ngwhjtH
   M) Muk;gf;fy;tp
   ,) Nky;epiyf; fy;tp
   <) gl;lijhhp kw;Wk; mjw;F Nky;

6. FLk;gj;jpd; tif
   m) jdpf;FLk;gk;
   M) $l;Lf;FLk;gk;
7. FLk;gj;jpd; khj tUkhdk;
   m) & 2000-3000
   M) & 3001-4000
   ,) & 4001-5000
   <) & 5000 f;F Nky;

8. nrhj;ijg; gy; gpur;rpid FLk;gj;jpy; ,Uf;fpwjh?
   m) Mk;
   M) ,y;iy
   ,) njhpatpy;iy
nrhj;ijg; gy; cz;lhFk; fhuzpfis fz;lwAk; msTNfhy;

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<th>xUNgJk; ,y;iy</th>
<th>vg;NghjhtJ</th>
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<td>eP ,dpg;G gz;lq;fis rhg;gpLthah?</td>
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<td>eP yhyp ghg; rhg;gpLthah?</td>
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<td>eP rHf;fiu mjpfk; cs;s jpz;gz;lq'fis czT ,ilNtisfspy; rhg;gpLk; gof;fk; cz;lh?</td>
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<td>9.*</td>
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### APPENDIX – I

**SELF INSTRUCTIONAL MODULE**

**DENTAL CARIES**

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<td>14.</td>
<td>eP gy; Jyf;Ftjw;F tpuy;f fis cgNahfpg;ghah?</td>
</tr>
<tr>
<td>15.</td>
<td>eP rhk;gy; kw;Wk; nrq;fy; J}is gy; Jyf;Ftjw;F cgNahfpg;ghah?</td>
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<tr>
<td>16.</td>
<td>eP Ntg;gq;Fr;rpia gy; Jyf;Ftjw;F cgNahfpg;ghah?</td>
</tr>
<tr>
<td>17.</td>
<td>eP jpdKk; ,uz;L Ntis gy;Jyf;Fthah?</td>
</tr>
<tr>
<td>18.</td>
<td>eP Fiwe;jgl;rk; %d;W epkplkhtJ gy;Jyf;Fthah?</td>
</tr>
<tr>
<td>19.</td>
<td>eP gy; Jyf;Fk;NghJ gw;fspd; vy;yh gf;fq;fspSk; ftdk; nrYj;Jthah?</td>
</tr>
<tr>
<td>20.</td>
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</tr>
<tr>
<td>21.</td>
<td>eP gy;J}hpifia khjk; xU Kiw khw;Wthah?</td>
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<tr>
<td>22.</td>
<td>rhg;gpl;l gpd; cdf;F jz;zPuhy; tha; fOTk; gof;fk; cz;lh?</td>
</tr>
<tr>
<td>23.</td>
<td>eP cg;Gf;fiury; gad;aLj;jp tha; fOTthah?</td>
</tr>
<tr>
<td>24.</td>
<td>eP MW khjj;jpw;F xU Kiw gy; ghpNhj;jd nra;fpwhah?</td>
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Introduction:

“Mouth is the mirror of the body” This proverb depicts the importance of the healthy teeth for human life. Sound physical health relies to a greater extend on sound teeth. The various conditions that affect human teeth one among them is dental caries. Dental caries is the most prevalent disease of teeth in children and is commonly known as ‘tooth decay’. It results from destruction of mineralized tissues (enamel and dentin) of the tooth by the microbial activity in the dental plaque.

Definition:

Dental caries is a progressive and destruction of dentin and cavitations of the teeth. It can spread into the tooth pulp and may cause inflammation and abscess.

Causes:

- Micro organism- bacteria
- Increased frequency of carbohydrate consumption

Risk factors:

- Carbohydrate rich foods, chocolates which stick to the
teeth, chewing gum, cola beverages

- Poor oral hygiene with inadequate dental care
- Salivary gland dysfunction
- Receiving long term therapy with drugs cause dry mouth.
- Over eating
- Deficiency and excess of fluoride in water.

Decay Potential Foods:

- Dried fruits
- Hard and soft candy
- Cake, cookies, pie
• Chips

• Sweetened Fruit juice and cool drinks

**Signs and Symptoms of Dental Caries:**

• Pits and fissures of biting surfaces of teeth

• Cavity formation

• Toothache

• High sensitivity teeth to food substances

• Pus formation

• Difficulty to chew

• Swelling over the cheek

• Fever

• Gingivitis

• Bad breath
Investigations:
- Oral examination
- X-ray

Management:
- Analgesics to relieve pain.
- Antibiotics mainly in case of infection
- Incision and drainage of the abscess
- Tooth filling
- Tooth extraction

Home remedies for tooth ache:
- Garlic:
  Placing a clove of garlic with little rock salt on the affected tooth helps to relieve or cure the pain.

- Lime:
  This rich source of vitamin C prevents tooth decay and also provides toothache pain relief.

- Salt:
A salt water mouthwash helps to resolve tooth infection and helps to cure toothache.

**Clove:**

Placing a piece of clove in to the affected teeth may help to relieve the pain.

**Prevention of dental caries**

---

**Do’s**

**Diet:**

Take calcium and phosphorous rich food substances such as milk, curd, butter, fish, egg, meat, cereals, nuts, tomato, orange, amla, pomegranate and green leafy vegetables.
➢ Practice the habit of brushing your teeth at least twice a day

( Morning and bed time): Ideal brushing technique:

- Place bristles along the gum line at a 45-degree angle. Bristles should contact both the tooth surface and the gum line.

- Gently brush the outer tooth surfaces of 2-3 teeth using a vibrating back & forth rolling motion. Move brush to the next group of 2-3 teeth and repeat.

- Maintain a 45-degree angle with bristles contacting the tooth surface and gum line. Gently brush using back, forth, and rolling motion along all of the inner tooth surfaces.

- Tilt brush vertically behind the front teeth. Make several up & down strokes using the front half of the brush.

- Place the brush against the biting surface of the teeth & use a gentle back & forth scrubbing motion. Brush the tongue from back to front to remove odour-producing bacteria.
➢ Practice the habit of washing your mouth after every meal, after eating any snacks, chocolates and ice creams.

➢ Use the appropriate size of brush with soft nylon bristles change your toothbrush once in every two months regularly

➢ Use only fluoride tooth paste for brushing

➢ Establish a habit of undergoing dental check up at least once in three months

---

**Don’ts**

➢ Avoid using tooth brushes with hard bristles

➢ Avoid ash powder or brick powder for brushing the teeth

➢ Avoid eating food substances that contain high carbohydrate and sticky sugars

➢ Avoid taking medications without consulting doctors

---

**Complications of dental caries:**

If the caries are not identified at right time or if it is left untreated it may end up in complications such as

- Total destruction of teeth
- Dental abscess
- Sepsis
- Facial cellulitis
Conclusion:

Dental caries is highly prevalent and easily preventable disease. Healthy teethes are not only essential for eating but also for speaking and to give good looking appearance to our face. “Prevention is better than cure”. Therefore if we take necessary action at the earliest to prevent the dental caries we can have healthy teeth through out our life.
gw;nrhj;ij

Kd;Diu:
gy; Nghdhy; nrhy; NghFk; vd;gJ gonkhop. MNuhf;fpakhd cly; ey;ij NgZljw;F MNuhf;fpakhd gw;fspd; mtrpak; d;wpaikahjjhFk; ekJ gy;ypd; MNuhf;fpai;j gytpj Neha;fs; ghjpf;fpd;wd. gw;nrhj;ij Foe;ijfspiINa kpfTk; nghJtff; fhzg;gLk; xU tpahjpahFk; J gy;ypd; cl;fU kw;Wk; gy;ypd; Nkw;Gwj;jpYs;s jhJgbtpd; Nky; Ez; fpUkpfspd; jhf;fj;jpdhy; cUthfpwJ.

tiuaiu:
gw;nrhj;ij vd;gJ Ez; fpUkpfspd; jhf;fj;jpdhy; Vw;glf;$ba gw;Fop NehahFk;
gw;nrhj;ijia cz;lhFk; fhuzpfs;
  • Ez;fpUkpf; (ghf;Bhpah)

  • Mjpf khTr;rj;Js;s czTg;
    nghUl;fis cz;Zjy;

  • khTr;rj;Js;s czTg; nghUl;fis;>
    kpl;Iha;fs; kw;Wk; FspHghdq;fs;

    • tha; Rj;jkpd;ik

  • ckpo;ePHr;Rug;gpapy; Vw;gLk; NhshWfs;

  • Fiwe;j ,ilntspapy; mjpf czT
• ePz;l fhykhf cgNahfpf;fg;gLk; rpy kUe;fspdhy; Vw;gLk; tha; cyHTj;jd;ik

• kjpkQ;rpa kw;Wk; kpff;Fiuwthd G@iuL

jhJ cs;s Fbjz;zPiu ePz;lfhykhf
gUfjy;

• cyH go tiffs;

• fbdkhd kw;Wk; nkd;ikahd xl;Lk; jd;ikAila kpl;hla;fs;

• FspHghdq;fs;

• nuhl;b czT tiffs;

• mjpf ,dpg;G+l;lg;gl;l go urq;fs;

• tw;wy; (rpg;];)

• gw;nrhj;iji cUthf;Fk; rpy czTg;ngUl;fs;

• gw;nrhj;ijf;fhd mwpFwpfs;;
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  mhp;G Vw;gLjy;

• gw;Fopfs; cUthFjy;

• gy; Ntjid

• gy; $r;rk;

• gw;fspy; rPy;tbjy;

• fd;dj;jpy; tPf;fk;

• <Wfspy; tPf;fk;

• nky;y Kbahik

• tha; JHehw;wk;

**gw;nrhj;ijia fz;lwptjw;fhd ghpNrhjidfs::**

• tha; kw;Wk; gy; ghpNrhjid
• Ez; fjpH (vf;]-Nu) ghpNhj;j
gw;nrhj;if;fhd rpfpr;ir Kiwfs::
  • typ epthuzj;jpw;fhd khj;jpiufs; cl;nfhs;Sjy;
  • Neha; njhw;W ,Ug;gpd; Neha; vjpHg;G khj;jpiufs; cl;nfhs;Sjy;
  • rPo;f; fl;bia mWit rpfpr;ir Kyk; mfw;Wjy;
  • gw;Fopia epug;Gjy;
  • kpf Nkhrkhf Nrjkle;j gy;iy mfw;Wjy;
gw;nrhj;ijapdhy; Vw;gLk; Ntjidiaf; Fiwvf;f tPl;bNyNa gpd;gw;wf;$ba rpy vspa kUj;Jt Kiwfs::
nts;sg;G+z;L:
nts;sg;G+z;Lld; rpwpa cg;Gf;fy;ypidr; NrHj;J ghjg;jgile;j gy;ypd; Nky; itj;jhy; gy; typ ePq;Fk;.
vYkpr;ir:
vYkpr;ir goj;jpy; mjpf msT itl;lkpd;=rP rj;J cs;sjhy; mjd; rhW gy; Ntjidia ePf;ffTk;;> gy; NkYk; ghjg;jgiltijj; jLf;fTk; cjTfpwJ.
cg;G:
cg;Gf;fiuriy nfhz;L thiaf; nfhg;gsf;Fk;NghJ mJ typiaf;;Fiwvf;fTk;> Neha; njhw;wpidf; Fzkhf;fTk; cjTfpwJ.
fpuhk;G:
fpuhk;Gj; Jz;bid ghjg;jgile;j gy;ypy; itij;J fbj;Jf;nhz;lhj; typ epthuzk; fpilf;Fk;.
gw;irhj;ij cUthfky; jLf;Fk; topKiwfs::

✓ gpd;gw;wf;;$ba topKiwfs;
- fhy;rpak; kw;Wk; gh];gu]; rj;Js;s czTg; nghUl;fis (ghy;> japH> ntz;nya;> kPd;> Kl;il;> ,iwr;rp;> jhdpaq;fs;> nfhil;il tiffs;> jf;fhsp; MuQ;R> ney;ypf;fha;> khJis> gr;irf;fha;fwpfs; kw;Wk; fPiu tiffs;) mjpf mstpy; cl;nfhs;s Ntz;Lk;.

- jpdKk; 2 Ntis (fhiy kw;Wk; khiy) gy; Jyf;Fk; gof;fj;pid filgpbzf;f Ntz;Lk;.

rpwe;j Kiwapy; gy; Jtf;Fk; topKiwfs;:

- gy; Jyf;Fk; J}hpifia (gpu;) <Wfspd; Nky; 45 bphp Nfhzj;jpy; itf;f Ntz;Lk; mt;thW itf;Fk; NghJ J}hpifia (gpu;) gy; kw;Wk; <Wfspd; Nky; rphahf gLfpwjhdvd;gij cWjp

nra;a Ntz;Lk;.
• gy;ypd;ntspg;Gwj;jypypUe;J Jyf;fj;njhlq;f Ntz;Lk;. mt;thW Jyf;Fk; NghJ J}hpifia (gpu;J) Kd;Dk; gpdp;Dk; gy Kiw mirf;f Ntz;Lk;.

• J}hpifia (gpu;J) <Wfspd; Nky; 45 bfphp Nghzj;jpy; gy;ypd; cl;Gwj;jpy; it;jJ Kd;Dk; gpdp;Dk; gy Kiw mirj;J <WfspYk; gy;ypYk; gLkhW Jyf;f Ntz;Lk;.

• J}hpifia (gpu;J) Kd; gw;fspd; gpdp;dhy; it;jJ NkYk; fPOk; gy Kiw mirj;J Jyf;f Ntz;Lk;.

• J}hpifia (gpu;J) gw;fspd; fbf;Fk; gug;gpd; Nky; it;jJ Kd;Dk; gpdp;Dk; gy Kiw mirj;J Jyf;f Ntz;Lk; NkYk; ehf;fpd; gpdp; Gwj;jpy; ,Ue;J Kd; Gwk; Nehf;fp Jyf;Fk; NghJ ghf;Bphah Nghd;w JHehw;wk; cz;lhFk; fpUkpfs; ePf;fg;gLfpd;wd.

• kpfTk; nkd;ikahd ehHfisf; nfhz;l> rhpahd msTs;s ieyhd; J}hpifia (gpu;J) gy; Jyf;f cgNahfpf;f Ntz;Lk; NkYk; gy; Jyf;Fk; J}hpifia Fiwe;jJ ,uz;L khjq;fSf;F xU Kiw khw;w Ntz;Lk;.

• czT kw;Wk; jpd; gz;ls;fs; (J; fphpK;> kpl;lua;> FspHghdq;fs;> nuhl;b tiffs;) cl;nfhz;lgpd; thiar; Rj;jkhf ePhpdhy; nfhg;gspf;f Ntz;Lk;)

• gy; Jyf;f G@iuL rj;Js;s gw;giria kl;LNk cgNahfpf;f Ntz;Lk;.

• Fiwe;jJ %d;W khjq;fSf;F xU KiwahtJ gy; kUj;Jtiu mZfp gy; ghpNrhjid nra;J nfhs;s Ntz;Lk;.
APPENDIX - J

Collecting data
Examination of dental caries
Distributing self instructional module