

DENTAL HEALTH STATUS OF PRE-SCHOOL CHILDREN

BY

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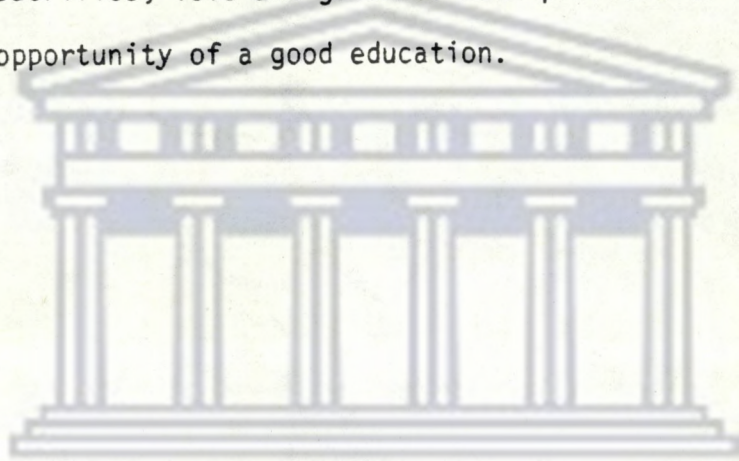
WESTERN CAPE

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DEDICATION

This dissertation is dedicated to my parents whose sacrifice, love and guidance have provided me an opportunity of a good education.



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CHAPTER ONE



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CHAPTER ONE

DENTAL HEALTH STATUS OF PRE-SCHOOL CHILDREN

Introduction

In the past the dental health of children has been largely neglected, and not much attempt has been made to involve parents on the importance of caring for their children's teeth. With the result, dental problems begin in the early years of life and then become a greater problem as the children grow.

The two common dental diseases which affect these children are dental decay or caries, and periodontal disease. However, the disease which poses the greatest challenge among children is dental decay, which is the primary cause of children losing their teeth. Studies have been done among children of this age to determine the extent of these diseases. The results of these studies have shown, that these dental diseases are becoming a major problem.

In the second chapter the causes of both these diseases, as well as their prevention will be discussed. Pre-school children are at an age at which their lifestyle is totally dependent and controlled by their parents and the third chapter deals with the way that parents can influence the child's dental health behaviour. Chapter Four outlines a dental health programme for pre-school children, involving parents, teachers, as well as pre-school children, and Chapter Five describes a pilot project and its results.

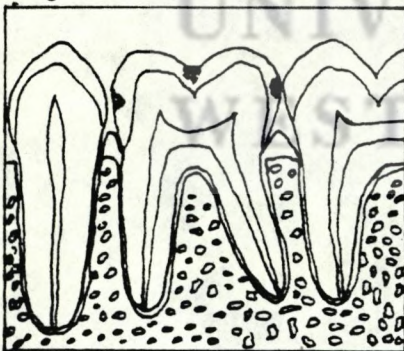
Definition of Dental Decay

Menaker (1980) defined dental decay or caries as: "a microbial disease which affects the calcified tissues of the teeth, beginning first with a localized dissolution of the inorganic structures of a given tooth surface.

by acids of bacterial origin, and leading to a disintegration of the organic matrix". In addition to the presence of plaque, which is a colourless film of material, that adheres to the tooth and is composed of masses of bacteria, an essential cause of dental caries is sugar, in particular sucrose. The bacteria in the plaque not only converts the sugar into acids, but also holds the acids in close contact with the tooth. At first the enamel is affected at localized areas. Pits and fissures are particularly susceptible as well as contact points in adjacent, abutting teeth, and near the gum margin. Some people are more resistant to attacks than others, there is however nothing from the nutritional point of view apart from fluoride which can aid in this resistance. The incorporation of fluoride into the developing tooth, before it erupts into the mouth, has a direct effect on the tooth's susceptibility to decay by providing the tooth with resistance against dental decay, as it is not dissolved by acids.

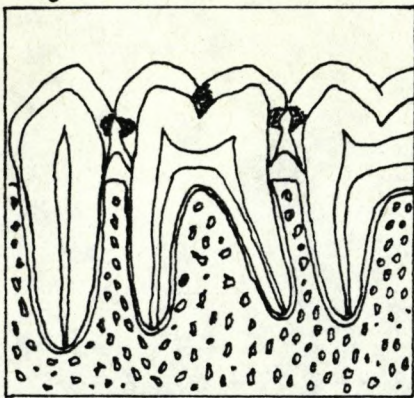
The Stages of Dental Decay

Figure 1A



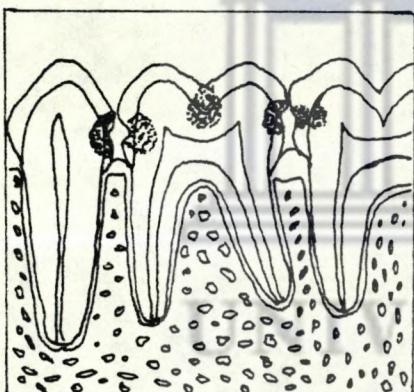
It begins with the demineralization of only a few crystals of the calcium, and a small zone on the surface of the enamel becomes porous, showing a white spot. It occurs mostly between the teeth or at the bottom of the fissures. At this stage the fine protein support structure of the surface crystals are still intact, and demineralization is reversible which means the crystals can reform. Keeping the tooth clean of plaque can allow remineralization of these areas by the depositing of crystals from minerals dissolved in the saliva.

Figure 1B



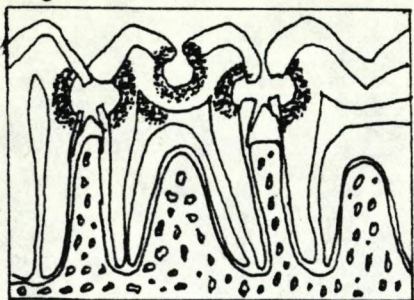
When there is plaque on the tooth and the presence of sugar, an acid is produced which dissolves the mineral crystals on the tooth surface. When enough of the crystals have been dissolved, the delicate protein framework will collapse. Once this has occurred complete remineralization is not possible and a cavity is formed. This cavity is very small at first, but as more plaque forms the dissolving process goes on and the cavity gets bigger. After a time the cavity reaches the end of the enamel.

Figure 1C



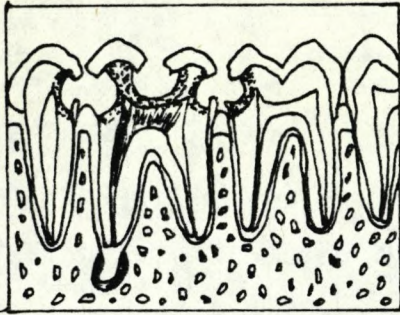
Once the cavity has reached the enamel, the acid starts to dissolve the dentine underneath. Because the dentine is softer, the decay spreads faster. At this stage pain may be felt, because the tooth's fine nerve fibres and their filaments are both sensitive to the acid which are produced by sugar getting into the plaque at the bottom of the cavity.

Figure 1D



The final stage occurs when the decay has spread right through the enamel and dentine and reached the pulp. The bacteria infects the pulp, and severe pain is felt because of the nerves in the pulp.

Figure 1E



The tooth around the pulp is rigid therefore the inflamed tissues cannot expand, the pressure builds up fast. This pressure finally bursts through the tiny hole at the end of the root. The pain may be reduced but the gum around the tooth becomes swollen and inflamed.

Definition of Periodontal Disease

This is a chronic, progressive destruction of the supporting tissues of the teeth. Periodontal disease is not important in childhood, but the neglect of gingivitis which is the inflammation of the gingiva or gum, can lead to periodontal disease later in life. The World Health Organization in (1961) stated that 80% of young children are affected by gingivitis, and that almost the entire population have experienced gingivitis, periodonitis or both.

Periodontal Disease

The cause of this disease is plaque, and the severity as well as the prevalence of this disease varies according to (i) social and (ii) local factors.

i) Social factors:

In surveys where the severity and prevalence have been assessed, the disease has been found to progress throughout life. In both the primary and secondary dentition of children a high prevalence of gingivitis has been seen, however periodontal disease is uncommon. From the age of thirteen years there is an increase in the proportion of people with periodontal pockets and alveolar bone loss. "The disease is more prevalent in Asia and Africa than in Europe, Australia and in the U.S.A., and the difference exists between the white and the black population in the U.S.A". World Health

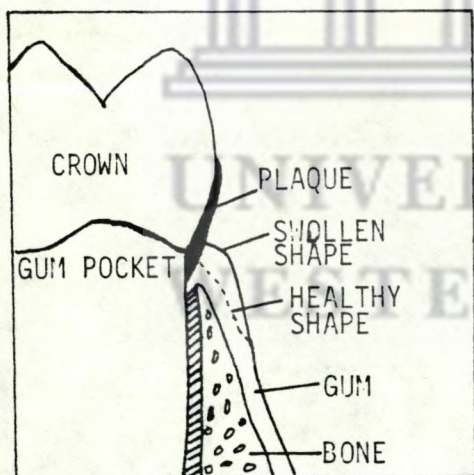
Organization (1978). Other factors such as difference in the dental hygiene habits, education, economic level and the individual's environment should also be considered as regards the prevalence of this disease.

ii) Local Oral Habits:

Irregularities around the teeth, such as occlusion, overhanging fillings, poorly filled teeth and calculus, because of their rough surface enhances the retention of plaque. With the progression of the disease, the crevice between the gum margin and the tooth enlarges. This enlargement forms a periodontal pocket, which forms a means for more plaque to accumulate. These factors have an influence on the severity of periodontal disease.

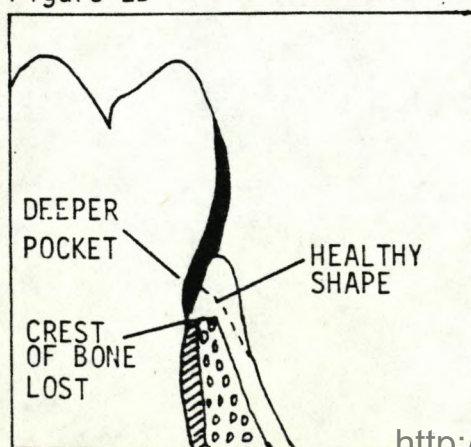
The Stages of Periodontal Disease

Figure 2A



This process begins with the presence of plaque on the teeth next to the gum. This causes the gingiva to change colour from pale pink to red and become slightly swollen and shiny, whereas the healthy gum is stippled like an orange peel. These gums are liable to bleed when being brushed. At this stage no pain is felt.

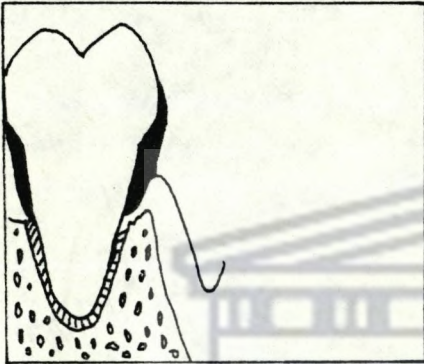
Figure 2B



The plaque on the tooth then causes the uppermost fibres of the periodontal membrane, which lie between the root and bone to be destroyed. This is followed by the loss of bone they were attached to. A space is created between the gingiva and

the root of the tooth and is called a periodontal pocket. This periodontal pocket begins to get deeper as the bone level falls. The gums are now red, swollen and still liable to bleed when brushed. There is still no pain at this stage.

Figure 2C



The bone is now lost and the gum has begun to move down towards the root, and the gum pocket is now deeper. (e.g. more than 6mm). The tooth now appears long, and may begin to feel a bit loose.

Figure 2D



This final stage does not usually occur until a person is aged forty or fifty, but can sometimes be reached earlier. Much of the bone around the teeth has been lost, therefore some of the teeth are loose and pain may be felt. It is at this stage that the teeth may have to be removed.

The Prevalence of Dental Disease in Childhood

According to Barnes (1977) the prevalence of dental decay or caries in developing countries is lower than developed countries, however with industrialisation the decay prevalence in the developing countries is rapidly increasing.

Both dental decay and periodontal disease pose a problem in young children. However, dental decay presents the greatest challenge, since it has become the most prevalent disease among children between the ages of three and eighteen. Stoll (1977) stated that "up to 98% of children will

at some time in their school lives experience tooth decay, or disease of the supporting tissues which is periodontal disease".

Studies have been carried out to determine the extent of dental diseases of children in Africa. These studies show that this is a problem among young children, and it has been getting worse among children between the ages of one and six years of age. The problem extends into their later life and for some children results in them losing their teeth. Van Wyk et al. (1977) did a study among the Indian community in the Cape. They observed a high prevalence of dental caries in the group. The result of the average decayed, missing, filled teeth (DMFT) score can be observed in Table 1. From this study it was found that when these children reached the ages of thirteen to nineteen years and twenty to twenty-nine years, there was an increase in tooth loss which was due to dental caries. At the age of six a $\frac{1}{3}$ of the teeth are affected on average. At the age of thirteen it had doubled. In a study of Cape Malay children Van Wyk et al (1976) found there was a high prevalence of dental caries among the subjects. The results of the decayed, missing, filled teeth (DMFT) score can be seen on Table 2. This study showed that dental decay was apparent from an early age. The figures from four years increased with age to 13.1 at the age of nineteen years. After thirty years the majority of the subjects were found to be edentulous, and it was rare to find people with natural teeth after the age of 40 years. Van Wyk et al. (1976) found that these dental problems were due to the lack of dental awareness and poor oral hygiene which is combined with a low fluoride content in the drinking water, also certain dietary habits of the Cape Malays.

TABLE 1

The average DMFT scores of males and females in various age groups in the Indian community in the Cape.

AGE (YEARS)	DENTITION	AVERAGE DMFT SCORE
Younger than 6 years	deciduous	7.7
7-12	mixed dentition	10.2
13-19	permanent	14.5
20-29	permanent	21.4

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TABLE 2

The average DMFT scores of various age groups among the Cape Malays.

AGE YEARS	AVERAGE DMFT SCORE
4	5.6
8	8.8
15-19	13.1
25	24

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Social Factors Influencing the Dental Health of Children

Studies have also been carried out to measure the amount of sucrose intake, which causes dental decay. According to Richardson et al. (1978) there was a difference in sucrose intake between the black and white South African pre-school children between the ages of 1-6 years. The assessment of sugar intake was done by using a questionnaire. The number of subjects from various ethnic groups can be seen in Table 3. The highest average intake of sucrose was found among the white children the lowest being in the rural black children, and the intake of the urban black children being intermediate.

The vast difference in diet between the black and white children can be explained as follows:

- i) The difference in their dietary habits.
- ii) Children from a lower socio-economic group cannot afford to buy great quantities of sweets, and their homes tend to be at greater distances from shops.
- iii) Since the intake level in fluoride aids in resistance to dental decay, the difference could be due to the fluoride content of the water in different areas. Children from fluoridated areas are at more of an advantage than those children from non-fluoridated areas.

TABLE 3

The mean daily sucrose intake of urban and rural black children and white children between the age of 1-6 years.

GROUP	SUBJECT NUMBER	MEAN DAILY SUCROSE INTAKE
Rural black	427	52 gram
Urban black	248	62 gram
Urban white	463	88 gram

In the continent of Africa most people are still living in rural areas, however much urbanisation is occurring due to people moving closer to employment in search of jobs. People who have lived in rural areas, and are now living in urban areas, are becoming urbanised in their way of living. Their lifestyle and environment changes and so do their eating habits. Besides the difference between rural and urban groups, other comparisons can be made among ethnic groups. A study was done by Cleaton-Jones et al. (1976-1981) in the Province of Transvaal in South Africa. They found a difference in the percentage prevalence of dental caries between the different ethnic groups. A lower incidence was seen among the urban white children, and a higher incidence in the other groups. The highest frequency of dental caries was seen among the Indian children living in the urban areas.

Cleaton-Jones and his colleagues suggests this difference could be due to the fact that in the white population, the knowledge of dental treatment is better established than in the other groups. Dental treatment that had been carried out among the rural and urban black children, consisted mainly of extractions the majority of the others, even decayed ones being left untreated. Among the Indian group there were slightly more fillings done and more teeth missing. The main treatment carried out among the white children was fillings - however there were cases of untreated caries.

Conclusion:

In this chapter the two major dental diseases which are dental decay and periodontal disease have been defined and described. However, it is important to stress that both these diseases, are caused by a number of factors and that by having their causes removed, these diseases can be prevented or contained. In the following chapter the causes of these dental diseases will be discussed, as well as the preventive measures which can be carried out to prevent these diseases.

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CHAPTER TWO



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CHAPTER TWO

THE PREVENTION OF THESE DENTAL DISEASES IN CHILDHOOD

The studies which have been discussed above, show that the dental health of young children is poor. The dental disease which seems to be the most prevalent and severe among young children, between the ages of 1-16 years is dental caries. Therefore in order for many teeth to be saved for a lifetime, preventive measures should be taken early in the child's life.

Both dental caries as well as periodontal disease can be prevented by:

- i) Restricting foods and drinks containing sugar to meal times.
- ii) Regular and thorough brushing of teeth.
- iii) The use of fluoride toothpaste
- iv) The fluoridation of water supply.

i) Sugar Consumption:

In order to understand how eating habits affect dental caries, it is important to note that not only is the quantity of sugar consumption important, but also the frequency with which the sugar is consumed.

When plaque is present, and sugar diffuses into it, the bacteria in the plaque produces acids. Without the presence of these acids, the solubility of the calcium crystals is low and the tooth cannot be dissolved. Therefore when an acid is produced, the balance of the acidity in the mouth is upset. Acidity is measured in units called pH. The scale of the pH runs from 14-0 the lower the pH the more acid is the solution, and conversely the higher the number the more alkaline is the solution. With a pH7 there is no acidity or alkalinity in the solution and is said to be neutral.

Saliva which is present in the mouth is slightly acidic, with a pH of 6.5 which has been described as a balanced state - John Beresford (1980). In order for the balanced state in the mouth to be upset an acid has to be produced. When the pH falls to below 5.7 it is said to be at a critical level in which decalcification takes place. The effect of the frequency of intake of sugar can be explained by the use of the graph called the "Stephan Curve" (Figure 3), named after the man who described it.

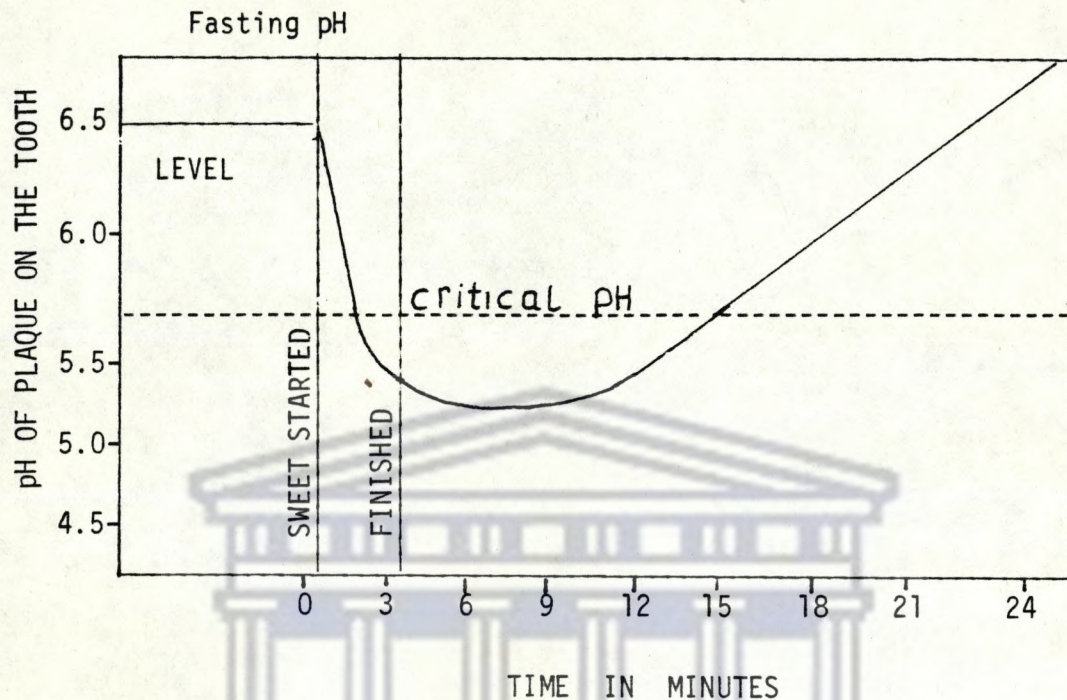
When a child sucks a sweet the:

- i) Sugar is dissolved in the saliva and the pH is still 6.5.
- ii) The sugar solution then dissolves into the plaque.
- iii) The bacteria and sugar form an acid, the pH then starts to fall below 6.5.
- iv) Within 1½ minutes of the sweet being sucked the pH passes the critical stage which is 5.7.
- v) It is at this stage that the tooth begins to decay.
- vi) Once the sweet is swallowed the sugar in the saliva is swallowed, however the bacteria works on the sugar which has already diffused into the plaque, and the pH continues to drop.
- vii) After about 6 minutes the pH starts to rise and after 13 minutes the pH rises to above critical level and the decay stops.
- viii) However if after ten minutes of eating the sweet, another is eaten the pH state has not yet risen into the safe level when more sugar diffuses in and more acid is produced. The pH then drops to a critical stage of 5.7 and more decay occurs.

The type of sweet which the child consumes also has an effect on the pH balance in the mouth. Sweets which are sticky and have a tendency to sticking to the teeth, have a slower oral clearance rate than those which are less sticky.

FIGURE 3

STEPHAN CURVE

ii) Toothbrushing Twice A Day:

People in the past years have commonly assumed that toothbrushing alone can control dental decay. However the Health Education Council (1981) found that dental decay can only be controlled by toothbrushing together with the limiting or restricting of sugar consumption, and the use of fluoride in toothpaste or in the water supply. For periodontal disease however, there has been found to be a relationship between plaque and chronic periodontal disease in children and adults, plaque deposits have been known to cause a change in the gingiva or gum, which is the early stage of periodontal disease. Besides sugar control in children, they should be trained to remove plaque from the teeth by regular brushing. Children should understand at a young age before entering school, that oral cleanliness is a part of the daily routine. Starkey (1977) reported that most children are incapable of brushing their own teeth effectively. Therefore parents should be taught to help their children in brushing their teeth, until the child is at an age

16

where they can control their own toothbrushing effectively - the age advised is 6-7 years. The methods of cleansing depends on the age of the child. It is good though to begin cleansing a child's teeth as soon as the first teeth have erupted into the mouth, normally at the age of approximately six months. This can be done by using something soft like a cotton bud. As soon as the child gets to the age of 2-3 years a child's toothbrush can be used.

iii) Fluoridation:

The use of fluoride helps to provide teeth with resistance against dental decay. Fluorine is an element which combines with other elements to form fluorides. These fluorides are present in some water in low concentrations of 1 ppm, which means 1 gram of fluoride in a million grams of water.

This fluoride can be enhanced in two ways:

- 1) Systemically - during the period of tooth development.
- 2) Topical application after eruption of teeth.

When there is the presence of fluoride during the development of the teeth and after the eruption of them, there is an effect on the progress of dental decay. Fluoride can be systemically administered most effectively and efficiently by the fluoridation of water supply. The Health Education Council of the United Kingdom (1981) stated that "the association between the natural presence of fluoride in public water supplies and low caries experience, has been demonstrated by over 95 surveys in 21 countries including the United Kingdom". These surveys have confirmed that when the fluoride content in the water is about 1 part per million (1 ppm) there is about a half reduction in caries.

Fluoride acts in two stages i) it diffuses into the body and is used by the toothforming cells, to make crystals which have fluorides built in them.

These crystals are less soluble and resist acid attack. ii) Once the tooth erupts fluorides from the water are deposited onto the surfaces of the crystals of the enamel. The outer surface of the enamel has the highest concentration of fluoride, which acts as a resistance to acid which is built up by the bacteria and sugar. Fluoride is an important factor in reducing dental decay, especially in children, when their teeth are still developing and after eruption. The fluoridation of water supply in communities should be encouraged. Fluoride can also be administered in the form of tablets given to the child from birth to the age of thirteen years, as both the primary and secondary dentition calcify in this period. This fluoride can have a beneficial effect on the child's teeth for a lifetime, if effectively taken.

The daily dosage is:

0 - 2 years	=	0.25 mg
2 - 4 years	=	0.5 mg
4 + years	=	1 mg

There are other useful ways of taking fluoride once the tooth has formed and erupted. These are topically in the form of solutions and gels containing 1.2% sodium fluoride. This is applied by the dentist or oral hygienist to the teeth of patients two or three times a year. In addition, as the Health Education Council points out, fluoride toothpastes, which came into general use in about 1974 have shown important caries reduction by virtue of their topical effect.

Conclusion:

In this chapter the prevention of these dental diseases have been discussed. However, in order for these preventive measures to be carried out, behaviour changes have to be brought about in the individual. In children these behavioural changes can be difficult to achieve, because of the great

influence of other persons, particularly the parents on his behaviour.
In the following chapter these factors will be discussed in detail.



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CHAPTER THREE



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CHAPTER THREE

REASONS FOR CHANGING DENTAL HEALTH EDUCATION IN THE CAPE

Influences In Dental Health Education In Childhood

As mentioned in the previous chapter, the most common and rapidly increasing dental disease among children is dental decay. Dental decay results in the loss of teeth among children of a very young age. By the time the child reaches school age, most of their primary teeth are decayed or missing and the permanent dentition also shows evidence of being decayed. Therefore effective health education aimed at changing or adopting habits to promote the good dental well being should be regarded as an important measure.

The World Health Organisation (1969) defined the objectives of health education as to persuade people to:

- i) Adopt and sustain healthy life practices;
- ii) use judiciously and wisely health services made available to them;
- iii) make their own decisions individually and collectively in order to improve their health status and environment.

The first objective is specifically appropriate to this study, as dental diseases can be influenced by people adopting healthy life practices. Their habits in controlling their intake of sugar, removing plaque effectively and using dietary fluoride all affect the incidence of dental diseases. A second factor in combating dental disease is the correct use of the dental services, as early diagnosis of these diseases can be made and treated appropriately. Thirdly the health of the individual's mouth can be improved by taking steps to alter the environment, for example by the fluoridation of public water supplies. 1

Agents in Dental Health Education in Childhood

The Health Education Council in the United Kingdom (1981) recognised health education as coming from two types of sources, the formal and informal.

- Formal - is a planned activity which is organised by a particular group or professionals, who try to influence the behaviour of the individual.
- Informal - is unplanned and related to the transfer of the knowledge of health within the family or community. Parents, friends, relatives and peer groups are important factors in this process. The facts which are often transmitted at times have no scientific validity being culturally rather than medically accepted.

Mechanic (1964) in his paper on mother's influence on children's health attitudes and behaviour, states that childhood learning is very dependent on the actions of parents, and the attitudes they manifest. However the effective or necessary outcome of such an influence should be a positive action such as reduction of sugars and regular toothbrushing. During the pre-school period the child learns by imitating the behaviour of their parents and friends. Rayner (1969) found that the factors which influence a child's oral health practices seem to be the most valuable, theoretical and practical clue to effective dental health education. He states that the dental health behaviour of a mother are the most important influence on a child's practices of dental health. Therefore dental health education should also be aimed specifically at mothers as well as the children. Parents should not just adopt the attitude but also set an example by reducing sugar intake and regular toothbrushing.

These dental health practices of the child are acquired from the child's observation as well as information given to them by parents. A child always remembers things more effectively, if done practically, therefore this can be encouraged in a child by parents and child performing these dental hygiene practices together. The education of a child is not only the responsibility of parents. The pre-school provides an opportunity for dental health education to be carried out with the children. Teachers at school especially in the first few years of a child's life, provide an access for formal health education. Because of this dental programmes which are carried out by teachers could prove effective. Programmes to be done with children, such as toothbrushing programmes, can be worked out and planned together with the teachers.

Children's Understanding of Dental Health

Another factor to consider in health education with children is their concept of dental health. When working with children it is necessary to bear in mind, the developmental stages of children's thinking. According to Piaget, Turner (1975) each child passes through four main stages each typified by different styles of thinking. For the purposes of this study with pre-school children Piaget's second stage, the preoperational is the relevant one.

At this stage the child is beginning to think symbolically, but it is only at the end of this stage that this symbolic capacity is fully developed. Their logical understanding is dominated by appearances. Through this stage the child's way of thinking is closely associated with their actions. Despite these limitations research cited by Kalnin and Love (1982) has shown that children at this preoperational stage can learn simple health rules. These rules should be concerned with their behaviour in order for the child to understand and remember them.

Dental Health Education Programme in the Cape

In the Cape Province I am responsible for dental health education for pre-school and primary schools. The dental education which is carried out in primary schools is done in the form of lectures once a year, as well as toothbrushing programmes which are done with the children in the first and second year of primary school. This approach to dental education is however inadequate and should be revised. This can be done by integrating the dental education into the school curriculum.

In the pre-school, dental education consists of the children being spoken to about dental care and toothbrushing programmes. A follow-up of the child's improvement in dental health has never been done. Therefore it has not been possible to determine the effectiveness of dental health education. Usually by the time the child reaches primary school, not much prevention has been established in the child in pre-school, this results in the neglect of the child's teeth. The reason for this is that the dental education in pre-school has been inadequate as it has not attempted to involve both the home and school. This is necessary since both parents and teachers play an important role in the child's life, as regards their attitude and habits in dental care.

In order to improve the dental education in pre-schools a continuous dental care programme can be planned whereby both parents and teachers are involved. The dental health education in the Cape Province is carried out by oral hygienists who are trained in this field but they are not always in close contact with young children as are the teacher and parent. The teacher who is in close contact with the child, has an advantage of knowing the child's abilities of learning a skill and with the right materials and professional support the education can be done effectively by her. In addition, the teacher could form a bridge between parents, children and hygienists.

If we in the dental profession are attempting to change a child's behaviour towards good dental practices we need an understanding of how these behaviour changes take place or how learning takes place. A child who is at the pre-school level is going through a learning process and is curious to find out things. If dental education is not taught in an interesting way and does not arouse interest and curiosity of the child, not much will be learnt. It should be remembered that learning new facts takes time, therefore an approach which is simple but factual, should be adopted.

These dental behaviour changes which are expected from a child are difficult ones and in most cases the information is new to them. Therefore not too much information should be given to them, taking into account their learning abilities at the preoperational stage. Also the child will learn more effectively on the basis of given examples and action of the expected behaviour, for example in the case of toothbrushing. A child at this age takes time to remember things, therefore a programme which is integrated into the pre-school curriculum as part of the daily school routine, will help overcome the process of information fading.

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CHAPTER FOUR

THE PLANNING OF A DENTAL HEALTH PROGRAMME FOR PRE-SCHOOL CHILDREN

The dental programme is being devised to improve the dental habits of pre-school children in the Cape Province. The programme has been chosen to be carried out in the younger children because, dental health practices in this period affect later dental health. The programme is aimed at pre-school children and their parents, and pre-school teachers as health educators. The aim of the dental programme should not be only to develop the child's knowledge, but also to ensure the child adopts the appropriate habits in order to improve their dental health. The two main points which should be emphasised in the programme are:

- i) Choosing foods which are not bad for the teeth.
- ii) Regular toothbrushing at least twice a day.

The programme will place more emphasis on the first message, since it is the most crucial factor in dental decay. This message is a difficult one, because most children have a taste for sweet things, and if these sweet foods are easily made available for the child by parents and relatives, it is a difficult behaviour to change. It is impossible to expect the child to stop sweets completely, because sugar provides valuable energy for the child and sweet foods are well established culturally. Therefore the encouragement of choosing safe foods should be made.

The message of brushing is encouraged by exposing the plaque by the use of colour dye. Children remember things better if it is something they see. The question of plaque should not be explained in too much detail. All that is necessary is that the child should understand that the plaque should not be present on the teeth, because it makes the teeth go bad. There should not be many messages given at the same time, since a child at this age is only able to grasp a few things at a time. The

programme is one which involves the child completely, since children at this age enjoy working in groups. The messages which are put across to the child should arouse their interest and bring about a motivation which leads them to actions. These messages are in the form of games and stories which involves the children.

The Involvement of Teachers

The teachers role in the programme is:

- i) To carry out the educational activity part of the programme with the pupils.
- ii) To carry out daily routine toothbrushing with the pupils.

The teachers in the programme will be provided with a Dental Health Kit which consists of the following materials (refer to practical report):-

- i) A story book containing a dental care story for children.
- ii) A plaque disclosing kit consisting of a disclosing liquid to disclose the plaque, and cotton buds to apply the liquid to the teeth.
- iii) A "Good food choice game" which will consist of a number of good food and bad food cards. Two boxes, one for good food and one for bad food will also be supplied with the game.
- iv) Stickers are provided to give to the children as rewards.
- v) A teacher's guide to assist them in carrying out the programme.

It should be made clear to the teacher that her role is an important one, and not much extra work is required of her. The teacher should supervise daily toothbrushing sessions with the children. The teacher is there to function as a resource person to develop an interest within the child. They should also be encouraged to make their own resources for the children containing dental care messages. The programme will be one which arouses interest in the teacher, and she should enjoy doing it with the

pupils. There will be some teachers who will feel hesitant about such programmes, due to the time taken up when carrying out the programme. Therefore the teacher should carry out the programme in the manner she wishes, provided the dental health practices and information are correct.

The Evaluation of Materials

On the completion of one year of the programme, the teachers will be invited to answer a questionnaire. The questionnaire will cover all aspects of the programme, including their judgement and experiences in using the materials as well as the responses of the children to the programme. They are also invited to give their ideas as regards the improvement of the activities used in the programme. In order to achieve their cooperation the importance of these preventive measures, and the needs of the programme should be discussed with them. This can be done at Parent-Teachers Association meetings or, when the parents bring the child into school.

The Involvement of Parents

Involving parents in the programme is important to ensure that the programme works. The dental programme will attempt to educate the parents regarding their children's teeth, and appropriate dental care treatment and fluoridation so that they will:

- 1) Assist their children with the programme, by supervising children's toothbrushing and choosing foods which are not harmful to the teeth. Parents should also discourage the frequent eating of sugar contained foods and they should also be encouraged to carry out these preventive measures with the children at home, and be an example to them.

- 2) Ensure that their child attends for dental check-ups and treatment.
- 3) Supervise the taking of fluoride tablets.

Each parent will be given at the beginning of the programme:-

- i) a leaflet containing information about the programme, as well as information regarding the two dental diseases;
- ii) a dental care kit (which will contain a toothbrush, toothpaste and toothbrushing record sheet). These items are intended to be used with the child at home, under the supervision of the parent.
- iii) a kit containing a child's jigsaw puzzle, a colouring book and a badge with a dental health message. These activities are intended to be used by the child at home with the help of parents.

Before the Programme

About a week or two before the programme begins, examination of the children's teeth will be carried out. A DMFT score (decayed, missing, filled teeth) and a plaque index score will be taken as a baseline. This score has already been used and experienced before and therefore could be an effective one. Consent will be obtained from the parents before this is done. Children who are identified as in need of urgent dental treatment during these examinations will be referred to the dentist. A session will be held with teachers and parents to get them orientated to the programme.

Follow-Up

Monthly visits will be made by the oral hygienist, in order to monitor the programme and support the teacher. Parents can be invited to allow them to join in and see the programme in action. If any problems are faced at home or school regarding the programme, the oral hygienist is present to help them.

Evaluation of the Programme

The behavioural changes that occur as a result of the programme can only be assessed after a long period. Once the programme has been carried out over a period of six months the progress can be evaluated.

- A) The progress of choosing foods which are safe for the teeth can be measured by this procedure:
- i) Each child must be individually evaluated, by offering them a choice of good foods and bad foods. No encouragement or reward must be offered to the child. The choice made by the child will be able to determine whether the programme has had an effect on their behaviour. This evaluation must be done in an isolated position where no influence can be made on the child by their class mates or teachers.

- B) The brushing progress can be measured by this procedure:

Mr Michael Craft in his "Good Teeth Programme" (1984) stated that the plaque index, has been accepted as the most reliable way of assessing the effect of mechanical cleaning on a short term trial. These plaque indexes are done on each child, at every monthly visit made by the Oral Hygienist. The plaque index which was taken at the beginning of the programme can serve as a baseline for comparison.

C) The evaluation of caries reduction:

The progress of dental caries is a lengthy process, as a result it can only be assessed after a period of one year or more. The DMFT score which was taken at the beginning of the programme can serve as a baseline for determining the progress of dental caries through the course of the programme. This comparison can be done by taking a second DMFT score when the child leaves pre-school to enter into Primary School. In addition on entry into school the DMFT scores of children who have been in the programme for 2 years, can be compared with those of children from similar socio-economic backgrounds who attended pre-school groups not in the programme. Thirty programme children and thirty controls would be randomly selected for this part of the evaluation.

D) The evaluation of parents

The progress of mothers assistance in the programme can be evaluated by providing individual interviews with some mothers. This could also be carried out at the oral hygienist's monthly visit to the pre-school. She will however, require the assistance of other oral hygienists to carry out the interviews. The interview will cover the parents attitudes to the programme, their knowledge about dental health and the childs progress of dental habits at home.

This evaluation will be able to determine whether the progress has had any improvement in the parents knowledge about their childrens dental health. It is also a means of determining whether any alterations or modifications are to be made to the programme.

Conclusion:

This programme has been designed to begin with children in their first year of pre-school, which is normally the age of 3 years and should continue until they leave pre-school which is the age of 5 years. By which time the child should have gained the basic dental health education. It is important however that these dental habits do extend into their later life. So it is important that they then experience a similar programme modified to the level of a primary school child and integrated into their school curriculum.



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CHAPTER FIVE



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THE RESULTS OF THE PILOT PROJECT

Some of the materials which are described in the programme were field tested to determine whether the material was suitable for the level of a pre-school child. The two aspects of the programme which were tried out in the pilot project were i) the "good food choice game" and ii) disclosing plaque and toothbrushing.

These materials used in the project were independently developed - however the idea of the "good food choice game" was based on the safe snack game of the "Good teeth programme", which was devised by Mr Michael Craft. The materials used were a flip chart which told a dental care story for the children. Secondly a "good food choice game", which consisted of two boxes one for the good food and one for the bad food. Pictures of good food and bad foods were cut out and pasted onto a hard backing.

The pilot project was carried out at a pre-school in Leeds. Forty children aged 4 and 5 years participated in the project. These children were of different backgrounds being Chinese, Indian, Egyptian, West Indian and English and therefore, some of them spoke and understood a limited amount of English. These children were taken in groups of six. They were first introduced to the programme by having a dental story told to them using the flip chart. A problem encountered here was those children who did not understand English, found it difficult to understand. This story would therefore have to be translated into the local language of the children. The pictures in the flip chart did however help some to understand the story. Then the "good food choice game" was played. This was done by placing the good food and bad food box in front of the children. The good food box has a drawing of a healthy mouth on it, the bad food box had a picture of a bad mouth on it, showing holes in the teeth from the bad food. The pictures were placed on the floor and each child was asked to choose a picture. Once

this was done they would have to say what food it was, to try identify whether it was good or bad food and then to place in into the appropriate box.

Even though some of the children in the group had a limited understanding of English, the game was understood by them and they were quite receptive to it. The children were able to distinguish where which food picture went. The only problem encountered in the game was that some pictures presented to the child were not clearly identified. The reason for this could be the fact that some of the pictures were presented in a form not familiar to the children. Therefore pictures clearly showing the different foods which the child is used to seeing at home should be used. Also some of the pictures did not resemble the normal size of the food, for example the picture of bananas was very small whereas the apples were life size. However, it is important to remember that these pictures were only shown once to the child. If this game is part of an ongoing project this type of problem can be overcome by the child becoming familiar with the materials.

The method used for disclosing plaque posed some problems. When told that the red dye on the tooth showed where the plaque was, some responded by saying it was blood. They did not understand that the plaque had been dyed red. It is clear to say that a child aged 4 and 5 years is too young to understand what plaque is, therefore this method can be modified by describing it in a different way, for example "the red shows us where the germs are".

This pilot project has proved beneficial in determining whether the material has been useful for children at the pre-school age, and the necessary alterations to be made before it is implemented. I wish to thank the staff and children of the Little London Nursery for their help in

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