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THE DEVELOPMENT OF A GUIDELINE FOR EVALUATING DENTAL HEALTH EDUCATION MATERIALS FOR DENTAL AUXILIARIES

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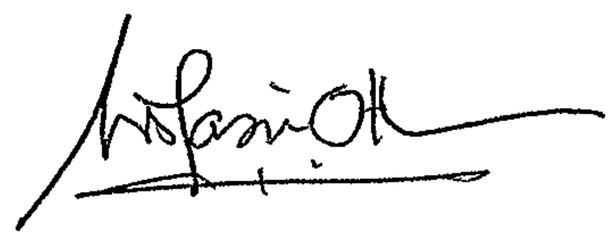

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CHAPTER I

1. INTRODUCTION

Dental health education materials are often used as aids in communicating with individuals or groups in a community on various aspects of dental health. This study is focused on visual dental health education materials. I will discuss the elements that need to be considered to improve the effectiveness of these materials in facilitating the understanding, retention and recall of information and change in attitude and behaviour.

1.1. Awareness and emphasis on dental health education

Dental health education on programmes have been conducted for decades by dental organisations and dentists in many countries throughout the world. New Zealand, for instance, introduced its dental health education programmes as early as 1921 (Kelly[54] 1978). In recent times, there has been increasing awareness and emphasis on the educational approach in the prevention and control of dental health problems (WHO[97] 1970). The reasons for this are the prevalence of dental diseases, the shortage of manpower (in most countries), the accumulation of knowledge on dental diseases (Rowntree[76] 1963), the trend in dental education to allocate more curricular time for preventive and community dentistry (Nasir and Nam[64] 1980), and the recognition that the individual play a major role in determining its own well-being (WHO[97] 1970). A contributing factor to the success of a dental health education programme is the

communication process. Therefore, a well-developed dental health education programme with emphasis on principles of communication is needed.

1.2. Dental health education in Malaysia

Recently, the Dental Division, Ministry of Health Malaysia established a Dental Health Education Unit. The primary function of this unit is to coordinate dental health education activities conducted by the State Dental Services. The dental health education activitiy commonly favoured by the state dental services is dental health talk with the use of simple and inexpensive teaching materials. Most of these materials are prepared by the dental auxiliaries themselves. The rest of the materials are from the Dental Training School and other organisations. Some of these materials are not suitable for the target group and yet they are used indiscriminately. This is probably because there are few rules to go by.

A guideline for evaluating the suitability of these materials in a particular situation, I hope, will be of value to three groups and their respective functions:

i. the Dental Health Education Unit in its role as the coordinator;

ii. the Dental Training School, Penang, to be used as a teaching material;

iii. the dental auxiliaries in designing and objectively selecting dental health education materials for the specific target group.

1.3. Objective

Communication, in relation to dental health, is a process of persuading people to adopt good oral health practice. There are four components to this process:

i. the communicator, the source or sender of the message;

ii. the message, the set of meanings being sent and received by the audience;

iii. the medium, the ways in which the messages can be transmitted or carried to the audiences;

iv. the audience, the receiver of the message.

This thesis is primarily concerned with the message delivered by a dental auxiliary (communicator) through visual teaching materials (medium) to enhance the transfer of information and influence action among school children (audience), particularly in the class-room situation.

1.3.1. Specific objectives

i. To note some of the issues in dental health education.

ii. To classify dental health education materials and describe those that are commonly used by the dental auxiliaries.

iii. To describe the elements that need to be looked into in evaluating dental health education materials used by dental auxiliaries.

iv. To present guidelines for evaluating dental health education materials specifically for dental auxiliaries in Malaysia.

1.4. Organisation of the thesis

The first chapter in this thesis is devoted to the provision of general background of the study. This will be followed by a discussion on some of the issues in dental health education with the aim of providing some of the inputs to the evaluation guidelines. Given the wide and diverse range of dental health materials, it is necessary to classify them, and this will be the focus of the third chapter. The fourth chapter deals with the elements that need to be looked into when evaluating dental health education materials. In the proceeding chapter I will describe the development of the guidelines for the evaluation of dental health education materials. Finally, the last chapter is directed to the presentation of the guidelines which is specifically directed to dental auxiliaries in Malaysia but hopefully, of general use in dental health education elsewhere.

1.5. Definitions

It is pertinent at this juncture to define some of the terms used in this study.

1.5.1. Dental auxiliary

Dental auxiliaries are members of a dental health team who assist the dentist in the provision of dental services. There are several types of dental auxiliaries, but in this study the term dental auxiliaries is used to refer to School Dental Nurses and Dental Surgery Assistants. One of the tasks of these auxiliaries is the promotion of

dental health. A description of the tasks of these personnel in Malaysia is attached in Appendix I and II.

1.5.2. Evaluation

The evaluation of dental health education materials is a value judgement of these materials through the identification of strengths and weaknesses so that the strengths can be maintained and the weaknesses improved for effective teaching and learning process.

1.5.3. Dental health education materials

These are tools that enhance the preparation of the children for healthful living. They should not be assumed to be self-explanatory.

CHAPTER II

2. ISSUES IN DENTAL HEALTH EDUCATION

Dental health education is an activity which is behaviouristic in character. It deals with people under a wide range of variables. Thus, dental health education is taut with controversies. In this chapter, the issues that will be discussed are:

i. Fear arousal communication;
ii. Effect of dental health education on knowledge and behaviour change;
iii. Advertising and dental health education;
iv. Evaluation of dental health education programmes;
v. Conceptual models of health behaviour.

2.1. Fear arousal communication

Ramirez et al.[68] (1977) defined fear-arousing communication as one which emphasises the negative consequences of failure to adopt certain recommendations. Fear of threat messages are often used to challenge the complacency people feel about "teeth". It creates tension and anxiety among the receivers. It used to be considered that the effectiveness of fear arousing message increased with the level of fear presented.

The earliest study on the effectiveness of fear arousal communication in dentistry was conducted by Janis and Feshbach[48] (1953). They tested the effectiveness of different fear levels in a dental health message directed

to high school students from a predominantly high social status. They concluded that the strong fear appeal was less effective than a moderate one in producing adherence to a recommended action.

Haefner[41] (1965) repeated and extended the original study by Janis and Feshbach and concluded that subjects of the high social status responded better to minimal fear, while the reverse was true for those of low social status.

Evans et al.[25] (1970) tried to determine whether fear arousal communication had an effect on behaviour change which was measured by Armin's disclosing wafer technique. This study was also an extension of the classic Janis and Feshbach study. They concluded that elaborate recommendations and positive appeal are effective in producing behaviour change. They questioned the necessity of using fear arousal to effect behaviour change.

Ramirez et al.[68] (1971) also attempted to determine the effectiveness of fear appeals in producing behaviour change. They used Poshadley's Patient Hygiene Performance (PHP) Index to measure behaviour change. Again this was a refinement of the Janis and Feshbach's study. Ramirez et al.[68] supported the original study that low threat message was effective in the dimension of intention to behave. On the other hand, they found that one type of appeal is no more effective than the other when actual behaviour was measured.

The study by Kegles[51] (1961), however, showed

that anxiety and fear were negatively correlated with dental visits.

The Dental Health Education and Research Foundation, University of Sydney (from hereon referred to in an abbreviated form D.H.E. & R.F.) is not keen in the use of fear-arousal communication. The organisation uses positive appeal in its dental health education materials following the recommendation by its expert committee. No concrete evidence was available from this organisation on the effectiveness of this approach. Nevertheless, there were subjective indications that its materials were well received by the users.

The findings on the effectiveness of fear arousal communication are inconclusive (Evans et al.[25] 1970, Higbee[43] 1969, Ramirez et al.[68] 1971 and Young[100] 1967). They attributed it to the following problems:

a. all studies done so far have been laboratory studies;
b. the researchers measured short-term effects;
c. most of them used young subjects;
d. most studies relied on intention to behave rather than compliance to recommended behaviour;
e. the various arousal messages used were of different lengths;
f. the studies which attempted to measure behaviour change used different indices.

Notwithstanding the above, several generalisations can be drawn from studies related to fear arousal communication:

a. There is no difference in high-fear and low-fear communication in its effect on actual behaviour.

b. The effect is usually greatest immediately following communication and dissipates with time. The rate of dissipation is dependent upon the specificity of the recommended actions and other factors.

c. It is doubtful whether there is long-range gain in acceptance once fear is raised above "adequate" threshold. Threshold levels vary in impact depending upon social class, personality structure, content, age, environment and so on. In the absence of a definition and specification of adequate threshold, the approach should suit the psychological and cultural background of well-defined target groups (Young and Striffler[102] 1969).

In particular reference to dentistry, there is a certain level of fear among school children. He or she fears the dentists, the disease, the pain thought to be associated with treatment and the complication of the disease (ugliness). The use of fear which is already existing in the minds of these children may raise the

level of fear well above the threshold. The result is instead of motivating them to the desired behaviour, the message becomes a barrier to communication and interest. It is not surprising then to note the decision by D.H.E. & R.F. to use positive appeal in their dental health education materials.

2.2. Knowledge and behaviour

Dental health education is an important component in efforts to make the public aware of the need for good oral health and to be responsible for their own well-being. Therefore it is not surprising that vast amounts of money have been spent by dental organisations to educate the public about oral health problems.

Rowntree[75] (1961), through his long-standing involvement in dental health education, observed that dental health talks and campaigns for school children increased the standard of dental health knowledge which was not related to the same standard of health practice.

It is recognised that dental health education helps to improve dental health knowledge of the audience (Cohen and Lucye[14] 1970, Gillig[36] 1969, Rayner and Cohen[69] 1970, Warren[92] 1980 and Williford et al.[93] 1967).

There are conflicting opinions and evidence, however, with regard to the contention that improvement in knowledge correspond to dental health improvement.

From his study, Stolpe[86] (1971) concluded that there was no clear indication to show improvement in

knowledge leads to improvement in oral hygiene or improved attitudes toward dental health particularly among low socio-economic groups.

Rowntree[74] (1959) conducted a dental health campaign using the concept of participation among the target groups. He found that the campaign was "remarkably successful" in changing the attitude of children towards dental treatment and inspection, and in their attitude to food. The above conclusion was drawn up through subjective judgement rather than objective assessment.

Finlayson's[27] study in Dundee (1961) indicated that:

a. the campaign had a marked effect on tooth-cleaning habit;

b. the effect on eating habits was not so marked;

c. a definite improvement in oral hygiene took place.

Six months after the campaign (Finlayson and Wilson[28] 1962), it was found that the oral hygiene of the target groups shifted towards the state recorded when the campaign started. Another follow-up study six years later revealed that their oral health returned to the pre-campaign standard and not different from the control group (Finlayson and Wilson[29] 1967). However, the interest and improvement were maintained over a much longer period in the children attending schools in the "above average" social grade.

From the above discussion we can identify some of the factors that influence the success of dental health education in producing behavioural change.

a. Dental health education programmes should be directed to suit a specific target group rather than a general target group.

b. The practical value of the content should be emphasised.

c. The message must be constantly reinforced.

d. There need to be attempts in gaining participation and involvement of the specific target group in preference to one-way communication flow.

2.3. Advertising and dental health education

The objective of marketing is to change the behaviour of a segment of the population. Its success is measured by the volume of sales of the product. To achieve this objective, market research is conducted to determine the needs and wants of that group of people rather than the product.

The objective of dental health education is also to change the behaviour of the people. In most instances, the focus is not on people but the "product". The needs and wants of the people especially the target groups are often neglected. To aggravate the problem, the measure of success of behavioural change through dental health education is complicated and unstandardised.

This point to the need to go out of our field and secure the help of other disciplines, and marketing is one of them. Kotler[59] (1976) believed that.....

> "the well-trained marketer can learn the special qualities of any market with time. He approaches a market with a method, and not a dogma".

The D.H.E. & R.F. have taken a laudable step in this area by appointing a marketer as its first Director.

Another area of cooperation is the advertising of dental products. Advertising provides a substantial contribution to the public's awareness of dental problems (D.H.E. & R.F.[24] 1981) and oral health information. Colgate's Fluoriguard directed the public particularly the children on the therapeutic effect of fluoride toothpaste and the need for sugar restriction. McLean toothpaste which also contains fluoride focus on plaque and the role of the dentist in the provision of dental care. In Malaysia, the advertisement of Signal toothpaste provides information on periodontal disease. Dental health educators should take note of the message conveyed by the advertisers and act accordingly to reinforce these messages in an effort to maximise the success of the programme.

The endorsement of Crest's stannous fluoride toothpaste (Procter and Gamble) by the American Dental Association in 1960 (D.H.E. & R.F.[24] 1981) and Fluoriguard's sodium monofluorophosphate toothpaste (Colgate and Palmolive) by the Malaysian Dental Association in 1975 is an example of

a symbiotic relationship between home dental care product manufacturers and dental organisations. The advertising of the products is in itself dental health education. The manufacturers capitalise from the credibility of the dental organisation to reap profits while the dental organisation in turn could provide input on the authenticity of the message and indirectly benefit from the expertise of these manufacturers to get the people to use fluoride toothpaste. It is generally believed that fluoride toothpaste contribute in the reduction of dental caries (Barnard[4] 1980, C.D.H.[16] 1981). After the endorsement of Crest by the American Dental Association there is a trend for other toothpaste manufacturers to produce fluoride toothpaste. At present the market is flooded with fluoride toothpastes.

The endorsement of dental products by the dental organisation leads us to the question of advertising of dental services. The Federal Trade Commission (United States) and the U.S. Supreme Court have paved the way to advertising by the professionals (Block[7] 1978 and Jago[49] 1980). The decision by the U.S. Supreme Court is not being received by the dental profession with enthusiasm. For example, 90.6% of the Fellows of the American College of Dentists oppose advertising of dental services, 8% supported it and the rest were undecided (A.C.D.[3] 1981). The reasons to the opposition mainly revolve around the issue of professionalism and ethics. We are so concerned

about our profession and the ethics in dentistry that we tend to forget we are operating in a business-like manner. Advertising of dental services is a form of dental health education. It is the provision of information to the public on the availability of the service, the costs for the type of services rendered, and the types of services available according to the expertise and interest of the dentist. It makes the public more aware of the need to do something about their dental health and gear them to seek these services.

2.4. Evaluation of dental health education programmes

Evaluation is an important part of the programme planning process. It has many definitions, purposes and meanings (Sheiham[80] 1978) and is faced with a number of technical problems (C.D.H.[15] 1981 and Sheiham[80] 1978). Sheiham[80] (1978) identified four types of evaluation:

a. Systems approach evaluation;

b. Comparative evaluation;

c. Management evaluation;

d. Relevance evaluation.

Needless to say dental health education should be considered as being made up of several components: the context under which it is operating; the resources (human, physical and financial) to conduct the programme; the way (process) in which the programme is being conducted; and the outcome of the programme. All these components are interrelated and need to be examined to identify the

effective and ineffective aspects of the total programme so that remedial measures could be taken to improve the programme in accordance with the pre-determined criteria.

Horowitz[47] (1978) noted that the dental health education programmes should be evaluated in terms of reduced incidence of dental diseases. He further suggested the use of common dental indices such as DMFT, DMFS, PMA, and Russell's Periodontal Index, to measure the success of the programme. He did not however, favour the use of these indices for measuring plaque for the reason that it is not a valid measure of dental disease. Plaque indices are commonly used by investigators to determine behavioural change as a result of the dental health education programme. If we are to follow Horowtiz's suggestion then we are faced with the enormous task of quantifying the reduction in dental diseases and relate it to the numerous preventive procedures. However, the success of the overall exercise of disease prevention can ultimately be measured with data on prevalence and incidence of dental diseases.

Evaluation in the dental health field is still to a large extent in its infancy. Dental health education programmes lack critical evaluation in determining their effectiveness and relative cost effectiveness. This is the most important reason for the relatively small proportion of funds allocated to health or dental health education programmes (C.H.S.[15] 1981).

2.5. Conceptual models of health behaviour

In planning, implementing and evaluating dental health education programmes (material included) we need to know the specific behaviour pattern of the people in order to achieve the desired behavioural change. How do people behave in relation to their health or dental health? Some of the answers to this question may lie in the proposed conceptual models of health behaviour. Before we explore these models, let us look into the general characteristics of dental disease.

Dental disease is the most prevalent disease of mankind. Almost everyone is susceptible to it, but it is not inevitable. It is essentially a chronic health condition but acute in nature in relation to dental care behaviour of the people (Davis[20] 1975). Utilization of dental services, in most instances, is spurred by episodes of pain. The disease is of low severity as compared to coronary heart disease, lung cancer, poliomyelitis, tuberculosis, etc. Therefore, it is not as threatening as other diseases.

Most of the conceptual models were derived from studies from the health field. Rosenstock's[73] (1959) model was the result of studies on poliomyelitis vaccination, Hochbaum's[44] (1959) model on mass X-ray screening for tuberculosis, Horn's[45, 46] (1966 and 1976) model on anti-smoking campaign and Suchman's[89] (1967) model on accident prevention among sugar cane cutters were some

examples. There were very few studies that attempted to look into the dental health behaviour of the people with the exception of Gochman[38,39] (1972 and 1977) and Kegeles[51,51,53] (1961, 1968, 1974).

The Health Belief Model (Rosenstock et al.[73], 1959 and Hochbaum[44] 1959) proposed that:

i. the psychological readiness to take action is determined by the individuals perceived susceptibility to a particular health condition and perceived seriousness of the consequences of contracting the condition;

ii. the course of action is believed to be safe and effective;

iii. the course of action is triggered by environmental factors (social pressure and convenience).

Criticisms to this model are:

1. It looked into how healthy people behave in order to keep healthy, and did not fully explain how people who are defined as diseased or ill can behave to get better (Sheiham[81] 1981).
2. It did not consider a person's past personal experiences in relation to his beliefs in its predictions (Gochman[38] 1972).

This model was supported by Kegeles[51,52,53] (1961, 1968, 1974) based on his studies and his review of studies on preventive dental health behaviour of the people. Gochman[38] (1972) also supported the general concept of

the model but suggested that the model be extended with the following considerations:

1. the introduction of motivational and experiential dimensions;
2. modification of a person's entire set of expectancies rather than specific expectancies individually;
3. socio-economic factors.

In a later study, Gochman[39] (1977) pointed out that we should distinguish clearly between the two psychological characteristics: perceived vulnerability and health motivation. Perceived vulnerability refers to a system of beliefs about a person's chances of encountering the health problem while health motivation refers to a system of preferences. This study revealed that perceived vulnerability was related to trauma but more closely and inversely related to self-concept (a person's assessment of his own teeth as part of the total body image).

Horn's[45,46] (1966 and 1976) Personal Choice Health Behaviour model is based on four dimensions which are not necessarily mutually exclusive. They are:

1. motivation for change;
2. perception of threat;
3. psychological utility;
4. environmental facilitation.

Stauffer[85] (1973) believed that this model is the most appropriate for dental health education.

Suchman's[89] (1966) Preventive Health Behaviour Model has some resemblence to the Health Belief Model. This model is based on the basic concept of classical epidemiology. The acceptance or rejection of a protective (preventive) health measure is classified as follows:

1. host - the internal tendencies of individuals (attitudes and beliefs) that predispose them toward or away from specific behaviour;
2. environment - the external influences in the environment that favour or oppose the course of action;
3. agent - the attributes of the action itself or the object or goal of the action that makes it attractive or unattractive to the individual.

These models contribute to the understanding of the general health behaviour of the people and facilitate the identification of factors that influence the effectiveness of dental health education programmes. It is perhaps beneficial if we are to summarise these models and relate them to dentistry.

I. Personal Readiness Factor

1. Perceived susceptibility - a belief that an event can happen to you.
   - Is it possible that I get dental disease?
   - Is it possible I have dental disease without realising it?

2. Perceived seriousness (severity) - a belief that the disease has serious consequences for him.

   - What are the consequences of dental diseases?
   - Will it affect my work, appearance, breath or chewing?

3. Perceived salience - a belief that the need to take a course of action is more important than a variety of things he might do.

   - How important is taking care of my teeth?

4. Safety and effectiveness - a belief that the course of action is safe and effective.

   - Is it safe to go for treatment of dental diseases?
   - Are they effective?

   Note: It is a common belief among people in my country (irrespective of socio-economic status) that extraction of teeth affects the eyes and that extraction of one teeth will lead to more extractions.

   - Is it safe to drink fluoride water or use fluoride toothpaste?
   - Are the methods of home dental care effective in improving my dental health?

5. Knowledge and ability to act - one must know how to act and in a position to take the desired action physically and psychologically.

   - How can I take care of my teeth?

- Am I in the position to be able to take care of my teeth?
- Why do I have to follow the procedures recommended by my dentists?

II. Motivation for change

1. Exemplar role

Parents set good examples at home and dental personnel, in clinics. Dental personnel plays the role of an exemplar role by getting dental treatment themselves.

2. Economics

Far more people believe that dentistry costs too much than believe that medicine costs too much and a large segment of the population defines dentistry as a luxury (Kegeles[53] 1974). Dental care is actually not expensive but dental neglect is expensive (Sandell[78] 1967).

3. Aesthetics

The benefits from the course of action are attractive smile, good facial appearance and absence of bad breath.

4. Mastery

The recognition of their capability to control dental diseases and their adverse effects.

III. Social factors

1. Social pressure

The influence of people around him to change

the behaviour. People who could provide social pressure are the religious leaders, friends, village headman, teachers, dentists, doctors and so on.

2. Social value

The course of action conforms to a set of positive social values.

3. Role obligations

The individual must associate the desired act as expected and appropriate for fulfilling his role obligations.

IV. Environmental factors

1. Favourable environment

The action or measure must be presented in an environment or situation favourable to its completion or use.

2. Convenience

This refers particularly to the provision of dental services. It includes the distance one has to travel to obtain dental care, the hours at which it is available, the types of services available, the acceptability of the facilities in which dental care is provided and the length of waiting time. Barnard[4] (1980) pointed out the accessibility, availability and acceptibility of dental services as some of the factors that led to increasing demand for dental services in a community.

V. Psychological utility

1. Effectiveness of the action

   The action or measure must produce the desired effect or promised solution.

2. Pleasure of action

   The action must offer more pleasure than pain. It cannot create too much discomfort or interference with what the individual likes to do. The freshness of the mouth after toothbrushing or prophylaxis encourage the person to continue with the action.

3. Previous experience

   The individual must have had positive previous experience with the desired action or measure.

4. Recurrence of disease

   The individual must be advised on the probable recurrence of the disease.

5. Patient-practioner relationship

   The patient must believe that the action taken is commendable and the practioner appreciates his action.

The personal readiness factors and the motivational factors influence the decision to take action. However, social and environmental factors themselves could trigger action. When a course of action is taken, the behaviour of the person may change (negative or positive) depending on the psychological utility of the action.

2.6. Summary

In this chapter I have identified five issues in dental health education: fear arousal communication, knowledge and behaviour, advertising and dental health education, evaluation of dental health education programmes, and conceptual models of health behaviour.

1. Fear arousal communication

I have drawn attention to the conflicting reports on the use of fear-arousal in affecting behavioural change and the problems inherent in these studies. I have also noted that the present trend is to use positive appeal in communicating with children.

2. Knowledge and behaviour

I have discussed the influence of mere transmission of information on attitudinal change, and suggested several ways of improving dental health education in producing behavioural change.

3. Advertising and dental health education

I have compared the role of commercial advertising and dental health education, noted the increasing involvement of dental organisations and its members in advertising of dental services, and suggested the need to adopt the marketing strategies in dental health education programmes.

4. Evaluation of dental health education programme

I commented that evaluation of dental health education is still in its infancy, but pointed out the possibility of measuring impact of dental health education in reducing dental diseases using available dental indices.

5. Conceptual models of health behaviour

I have described several models of health behaviour which were formulated through studies from other health disciplines. I have also attempted to bring together these models and relate them to dentistry.

CHAPTER III

3. CLASSIFICATION OF DENTAL HEALTH EDUCATION MATERIALS

Dental health education materials are those materials that enhance and lend themselves to the preparation of the community for healthful learning, with emphasis on dental health. This implies that these materials do not substitute the teacher (school teacher, dental auxiliary, dentist, etc.) but are dependent upon the skilful usage by him (her). These materials act as adjuncts to trigger interest, clarify, simplify, or increase understanding, and pave the audience to desirable learning and health practice.

There are a wide range of dental health education materials. They are derived from the field of education and related disciplines. Presented below is a classification of dental health education materials.

I. Visual
   1. Non-projected
      a. Blackboard
      b. Adhesives
         i. Flannelgraph
         ii. Magnetic board
   2. Mobiles
   3. Pictorial
      a. Charts
      b. Posters
      c. Flashcards

4. Three-dimensional

    a. Models

5. Projected

    a. Overhead projector

    b. Slides

    c. Filmstrips

    d. Silent cine-projection

    e. 8mm. loop film

II. Aural

    1. Tape-recorder

III. Audio-visual

    1. Cine sound film

    2. Video-tape

    3. Tape-slide

IV. Printed/Literature

    1. Pamphlets

    2. Leaflets

    3. Booklets

There are many other types of dental health education materials that are used by dental organisations and dentists but are not included in this classification or described in this chapter. The materials that will be described are those that are available and used by dental auxiliaries in the classroom situation. However, some of these materials are also applicable for use outside the classroom, for example in the waiting room of a clinic, in exhibitions and in the surgery.

3.1. Visual dental health education materials

3.1.1. Blackboard

The Blackboard or chalkboard or whiteboard (using felt pen instead of chalk) is a piece of apparatus which is used to convey a visual message. It is most often used by dental health educators in the classroom situation to give a lecture accompanied with simple drawings to make graphic some specific ideas. Several rules need to be followed to maximise the effectiveness of blackboard in helping to present the message (Cable[12] 1977; Schneider[79] 1965; Stoll[87] 1977):

a. keep it clean when not in use;

b. do not cramp up the blackboard with symbols;

c. erase unwanted material;

d. use appropriate colours to make the blackboard presentation more interesting and realistic;

e. use tools such as rulers, compasses and other devices to help you draw;

f. letters and figures should be large enough to be seen easily (this usually comes with experience);

g. do not "talk to the blackboard".

3.1.2. Flannelgraph

The flannelgraph operates on the same principle as that by which burs stick to the hair on an animal's back (Cable[12] 1977). Therefore, when a piece of flannel or felt which has a hairy surface is placed against a similar surface or rough surface such as sandpaper, it

will remain in position because the fibres interlock. Similarly, pictures and diagrams with a backing of flannel or sandpaper will be attached to the board covered with flannel cloth or other similar materials, such as dorset crepe, winceyette, surgical lint and velvet. It can be used as a poster to present a single idea, as a chart to show relationships, as a graph to present statistical data, or as a story board.

The flannelgraph is not suitable for outdoor use, especially in windy conditions, because of the weak attachment of the fibres.

3.1.3. Magnetic board

It is similar to that of the flannelgraph but uses a magnetic rather than a fibrous attachment. The board is laid with a thin sheet of metal and a small piece of magnet is glued to the back of the pictures. It is more expensive but the adhesion is more reliable than the flannelgraph. It is most suitable for outdoor use.

3.1.4. Charts

A chart is a visual symbol for summarising, comparing and providing other helpful means for dealing with the subject-matter. It does not need any special equipment to project or display, but usually requires advanced preparation.

There are two types of charts:

a. Wall-charts

They are used as displays to summarise certain points of the lesson or as permanent displays.

b. Flip-charts

They perform the same function as slides or film strips. A series of charts, like a film strip, develop a subject being discussed. Flip-charts are now frequently being used to replace the blackboard to capture the ideas of the audience during a discussion.

In general, the visual on the charts supplements and illustrates the verbal commentary. It also draws the attention of the audience to the main points of the topic under discussion.

Charts are an excellent method of obtaining student participation. The teacher has the content and time of presentation under his control.

3.1.5. Posters

Posters are used to attract the attention of the audience rapidly to a single idea. They could be in pictorial or literary form or combination of both. They are designed to gradually familiarise the audience by their power of repetition. Since they should be used for a specific purpose and not merely as a decoration, these posters need to be frequently replaced or their impact would be lost (W.H.O.[96] 1954). The impact of the poster is also dependent upon such factors as colour, design, picture, well chosen words and timely use.

Schneider[79] (1965) suggested that in the classroom situation, its value is greater in the initial stages of the lesson or unit of activity than as a terminal activity. This depends, however, on the type of poster. Posters depicting only a single idea is useful to trigger discussion while posters with several separate ideas can be used at the end of the lesson to summarise the main points.

3.1.6. Mobiles

Mobiles are pictures, letters or symbols that are hung separately and independently on fine threads where they can move. Mobiles seems to be a favourite teaching aid among New Zealand School Dental Nurse and Dental Therapists in Australia. The mobiles are suspended from the arm of the operating light and in direct vision of the patient on the chair. Their movement attracts attention and the combined visual images of the messages imprinted in the patient's mind. It also diverts the attention of the patient from the treatment being performed on her. Another advantage of using mobiles in dental clinics is that they create a lively atmosphere in the clinic.

3.1.7. Models

Dale[19] (1949) defined models as recognisable imitations of the real objects, usually similar to the original in every respect, except in size. It offers scope for a more realistic approach. The learning process is enhanced by the handling of the model.

3.1.8. Projected aids

The principle used in projected aids is shining a bright light through a transparent picture to obtain an enlarged picture projected on to a screen by means of a lens. These aids are relatively expensive, requires special skill to operate and there must be a power point in the room. These features restrict its use by dental auxiliaries, particularly in Malaysia.

3.2. Aural dental health education materials

3.2.1. Tape-recorders

Cassette tape recorders are usually preferred to reel-to-reel tape recorders because of its ease in loading and unloading, and relatively good sound quality. The use of tape recorders in dental health education is mainly limited to puppetry. The backbround music and script are pre-recorded leaving the dental auxiliary to concentrate on the manipulation of the puppet.

3.3. Audio-visual dental health education materials

These are aids which have both an aural (sound) and visual (picture) appeal. It is relatively expensive, requires electricity supply and skill to operate and excludes the teacher from the presentation. The equipment is somewhat cumbersome to carry around. It is seldom used by dental auxiliaries in Malaysia. Audio-visual materials on dental health available in Malaysia are obtained from sources outside Malaysia, particularly from United Kingdom and United States. From my observation, the accent and the level of language used in these materials are incom-

prehensible to school children in Malaysia.

3.4. Pamphlets and miscellaneous literatures

Dental health education literatures can be in the form of pamphlets, leaflets, brochures, bulletins, booklets and so on. These literatures vary in form, size, number of words and information. This category of dental health education materials is among the most widely used medium of health instruction. Evaluation of these materials are not often carried out. Therefore, dental health educators should be capable of, and responsible for the evaluation of these materials before using them for specific purposes of instruction. These materials are virtually useless for the patients unless used to supplement information or knowledge already passed on to the patient (audience) by the dental health educator (Gillings[37] 1981, Sandeli[77,78] 1963, 1967, Wolley[94] 1979).

3.5. Conclusion

Dental health education materials were classified into four categories: visual, aural, audio-visual and literatures and some of the commonly used materials were briefly described.

It was indicated that dental health education materials were merely to reinforce instruction and should not be used to stand by themselves. Media in themselves have little value and unless properly used may constitute a useless expenditure of time, money and effort.

Dental health materials of the literature type should only be distributed after instruction by the educator.

3.5. Summary

In this chapter, I have attempted to classify and describe dental health education materials commonly used by dental auxiliaries in the classroom situation. These materials were classified into:

a. Visual dental health education material
b. Audio-visual dental health education material
c. Audio dental health education material
d. Printed and miscellaneous dental health education material

I have stressed the availability of a variety of dental health education materials not listed or described in this classification, but are commonly used by dental organisations and the dentists in the dental surgery.

CHAPTER IV

4. EVALUATING DENTAL HEALTH EDUCATION MATERIALS

Dental health education is one of the tasks of dental auxiliaries. In performing this task, dental health education materials are often used. These materials must be evaluated if their worth and effectiveness are to be assured. In this chapter, I will discuss the factors that need to be taken into consideration when evaluating dental health education materials.

4.1. Educational diagnosis

It is common among dental health educators to use dental health education materials for all people irrespective of their age, sex, race, needs and cultural and socio-economic backgrounds. Sheiham[81] (1981) pointed out that this is the weakness of many dental health education programmes. It stems from the failure to develop adequate educational and social diagnosis before implementing a programme of activities. We have to take note that persons experiencing different socio-economic and cultural conditions differ in their interest, desires, attitudes and values, and these differences must be recognised and taken into consideration to make educational steps effective (Boek[8] 1965; Menendez[62] 1969). The effectiveness of dental health education materials in the same manner is dependent upon the understanding of the audience whom it is intended and environment in which dentistry is practiced, if it is to promote readiness, receptivity and action-taking.

For example, a material with the message to clean the teeth using the right toothbrush and fluoride toothpaste which is neither locally available nor hardly within the means of the people is of no practical value to the audience. The wisdom of emphasising a particular toothbrush or toothpaste becomes more doubtful particularly when the people in the area are used to chewing sticks. Under this situation, when properly used, the chewing stick is quite acceptable. On the factual basis, WHO[98] (1972) pointed out that the efficacy of toothbrushing as a public health measure to prevent dental caries should not be overemphasised, but instead, the effectiveness of fluoride dentifrices should be recognised.

An example of the influence of environment to perception was described by Ewan[26] (1980). "A dental health education campaign in the highlands of Papua New Guinea used a poster showing a smiling shiny-tooth crocodile to promote the concept of healthy teeth. Crocodiles are unknown in the highlands and so the symbolism was thought to be lost until the highlanders were asked what they thought it meant. They had decided that the crocodile was in fact a lizard and that since teeth of that size are not usually associated with lizards they had interpreted the poster to mean that even a lizard can grow healthy teeth if he takes good care of them. They interpreted the right message for the wrong reasons".

4.2. Objectives

Dental health educators must have a clear idea of where they are going in order to select, and use appropriate dental health education materials; and to know the extent to which their intentions have been successful. The objectives must be clearly and precisely expressed and realistically related to the needs, interest and ability of the target group. The formulation of objectives can only be effective if the characteristics of the target population are understood (Britt and Boyd[9] 1968, Bustad[11] 1976, Frame[34] 1968a).

4.3. Medium

By medium we mean the vehicle in which the message is conveyed. Decisions about which medium to use depends on such factors as the media that are available, the attributes of these media, ability of the user to use the medium, the preferences of the communicator, the environment in which it is to be used, characteristics of the audience and the objectives of the unit of instruction.

In an effort to get the audience involved in the teaching-learning process, it is important that the medium selected enables the audience to be a partner. This transforms the role of the audience, in the teaching-learning process, from passive to active.

Dale[19] (1949) and Parsby[67] (1976) stressed the need to select a medium that appeals to as many senses as possible. It would result in greater understanding and

longer retention of information, and greater possibility of behavioural change.

4.4. Language

Some of the educative materials are often difficult to read and the readability of the materials are not directed to specific target groups (Addy and Edmunds[1] 1977, Andemuwagam[2] 1972, Blinkhorn and Verity[5] 1979, Ford and Hartman[32] 1954, Knutson[57,58] 1952, 1953). Readability can be defined as the interest or ease with which an article or literature can be read. Several tests are available to assess the readability of the materials (Appendix III).

Readability of the material is influenced by:

a. Length of passage

Long passages are more difficult to learn than shorter ones.

b. Number of words and points

Too many words and points in a sentence interfere with the understanding of the passage. The material becomes progressively harder to remember as the length of the message extends beyond immediate recall.

c. Nature of the words

The words used must be understood by the audience. Technical terms are often incomprehensible to the lay audience and should as far as possible be avoided. If it is necessary to use the technical term, it should be explained carefully. However,

Blinkhorn and Verity[5] (1979) noted that the words plaque, fluoride and enamel are understood by most of the subjects of his study. This was attributed in part to the role of commercial advertising.

d. Illustrations

To facilitate comprehension the words must be relevant to the illustrations used.

e. Translation

In multilingual societies such as Malaysia several languages are used for communication. Most of the materials are in English and the translation to other local languages can be deceiving. I remember a cartoon by a local cartoonist Lat who brought up the problem of inaccuracy of translation in films. He showed a cowboy shouting "FIRE!" (shoot) and the sub-title was a direct translation which refers to flame. Therefore, in translating from one language to the other it is necessary to check the context in which it is used and to back translate to ensure there is no chance of misinterpretation.

f. Reading age

In the United States, the average person aged 25 years or more has had slightly more than one year of high school (Strauss[88] 1970) which is equivalent to the reading age of 12 years.

The average reading age in the United Kingdom is alsoabout 12 years (Blinkhorn and Verity[5] 1979). It is interesting to note that the audience with an educational level of about 12 years (reading age 17 years) found interest in information that was written at the primary six level (Ford and Hartman[32] 1954). A material for general distribution should be written for a level that is considerably lower than that of the majority of the population to ensure understanding of the material without loss of interest. Therefore, when preparing dental health education materials it is necessary to get information on the educational level of the audience.

My assessment of readability of some of the dental health education literatures (materials) is presented in Table I. I selected in random batches of about 100 words from some dental health education literatures and assessed the readability in terms of reading age using the Fog Readability Index (Gunning[40] 1952, Blinkhorn and Verity[5] 1979) as presented in Appendix III. For the reading age of other literatures the reader is refered to Appendix IV.

Table I : Readability of dental health education materials

NO.	TITLE	AUDIENCE	SOURCE	READING AGE
1.	Dental Health	School Teachers	N.S.W. Health Dept.	14.2 years
2.	Advice on Fluoride for Children	General public	Cooper	17.1 years
3.	Baby's Smile	Expectant mothers	D.H.E. & R.F.	10.9 years
4.	They're Your Teeth - Smile	Australian indigenous	- do -	9.3 years
5.	Your Smile Says You Care for Your Smile	Teenagers	- do -	9.6 years

The reading age of the three materials from the D.H.E. & R.F.[21,22,23] were found to be below the reading age of 12 years. This is attributed to the use of short sentences, few "polysyallables" and technical terms are either explained or substituted with common words. The reading age of 9.3 years for the material directed to the Australian indigenous people could be lower if not for the several long sentences. These sentences should have been broken down to several simpler sentences.

The material from Cooper[17] (a member of Cooper Laboratories International Group) was a reprint of the statement by Professor N.D. Martin which was published in Department Gazettes and Medical Journals. This explains the high reading age, comparable to the Times Newspaper (United Kingdom). Cooper reproduced the statement for the distribution to the general public without regard to

the reading age of their audience. They should have rewritten the statement to a reading level of 12 years or below and quote the source to ensure source authenticity and authority.

The material from the Health Commission of New South Wales[42] was directed to the teachers. Taking into consideration the educational level of the teachers, the readability of the material in terms of reading age seems to be about right. My doubt is on whether the numerous technical details used are comprehensible to them. The booklet seems to be more like "Notes for Dental Therapists" rather than "Teacher Guides on Health Education in New South Wales School - Dental Health".

4.5. Content

Much of the dental information available to the public is inaccurate and contradictory. This creates a barrier to changing behaviour (Sheiham[81] 1981, Young and Striffler[102] 1976). On the other hand, source credibility will add to the persuasiveness of the message (Kotler[59] 1976). To enhance behavioural change and arouse a drive for the required action, the content need to be scrutinised.

Technical information or message on aspects of dentistry should be authentic and authoritative. Scientific opinions must be up to date and accurate. Unapproved measures and practices on the basis of personal experiences not supported by credible sources should not be recommended. The credibility of the source will add to the persuasiveness

of the message. Conformity to the information supplied by credible sources could also eliminate the problem of contradiction.

Let us take for example the D.H.E. & R.F., I consider it as a credible source for New South Wales, if not Australia, in matters related to dental health education. It has produced a number of dental health education materials through a combined effort of "experts" from dentistry and related disciplines. The use of the information from the Foundation by dental personnel in New South Wales in educating the patient and also the distribution of the materials to these personnel could overcome the problem of authenticity, authority and contradictory information.

In Malaysia, the problem of contradictory information on dental health is enormous. We have dentists who graduated from different universities and dental nurses qualified from different phases of the development of the Dental Training School in Malaysia. The information given to patients differ among dentists and dental nurses and between dentists and dental nurses. This calls for a concerted effort by the Dental Health Education Unit, Ministry of Health Malaysia, the Dental Faculty, University of Malaya, and the Malaysian Dental Association to work hand in hand to produce dental health education materials in which the dental personnel in Malaysia can rely on irrespective of whether they are in the government service or private practice. The availability of dental health

education materials from a local credible source is advantageous especially for dental nurses to check on the authenticity of their information, and eliminate the problem of contradictory information.

An important barrier in dental health education in schools is that it has to compete with other subjects for curricular time (Young[101] 1971, Cohen and Lucye[14] 1970). To eliminate this problem it would appear that we need to be more selective in the dental health teaching. We have to emphasise on the information which are of practical value to school children and do not require memorising of facts. Patients and school children in particular could be motivated to improve their dental habits without having to know the technical information about structure and function of teeth (Blinkhorn et al.[6] 1981, Rayner and Cohen[70] 1974, Sutton and Sheiham[90] 1974).

Therefore, the approach to the selection of content is to look into questions people ask most often about their teeth. The rationale to this approach is that people are more interested in information that are relevant to, and important for them. Therefore, the focus is on what they want to know and do so as to satisfy their needs and clear their doubts. Many commercial advertisers and dental organisations are using this approach. We have to stress that the questions must not come from the thoughts of the designer of the dental health materials. The D.H.E. & R.F. uses this approach in two of its dental health education booklets: "They're your teeth - smile" and "Your

smile says you care for your smile". Sample questions extracted from these booklets are as follows"

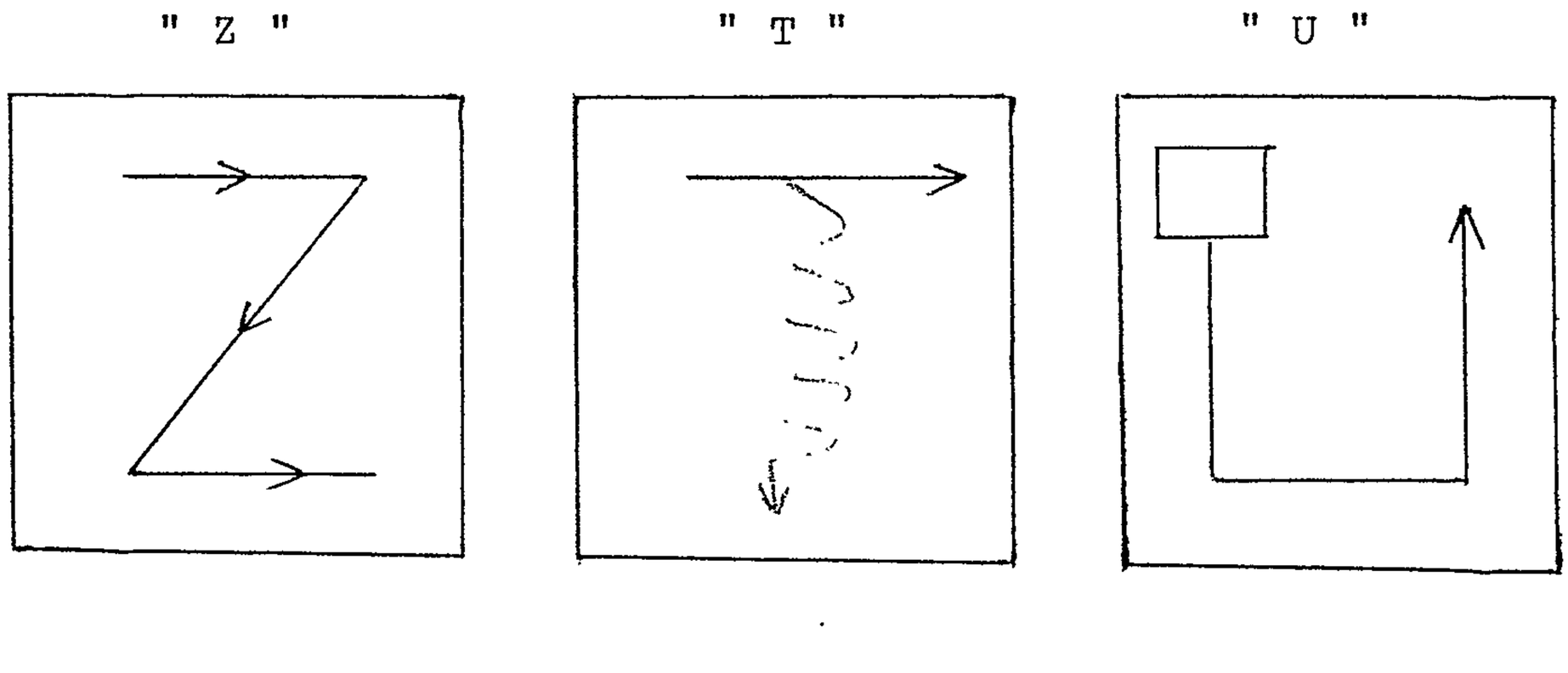
- I brush my teeth everyday, but why do I still get cavities?
- What causes bad breath?
- Are commercial mouthwashes useful or necessary?
- Why do gums bleed? What can I do?
- How can teeth be lost from gum disease?
- My teeth are stained, can I make them whiter?
- How can my children have good teeth?
- When do I start cleaning my child's teeth?

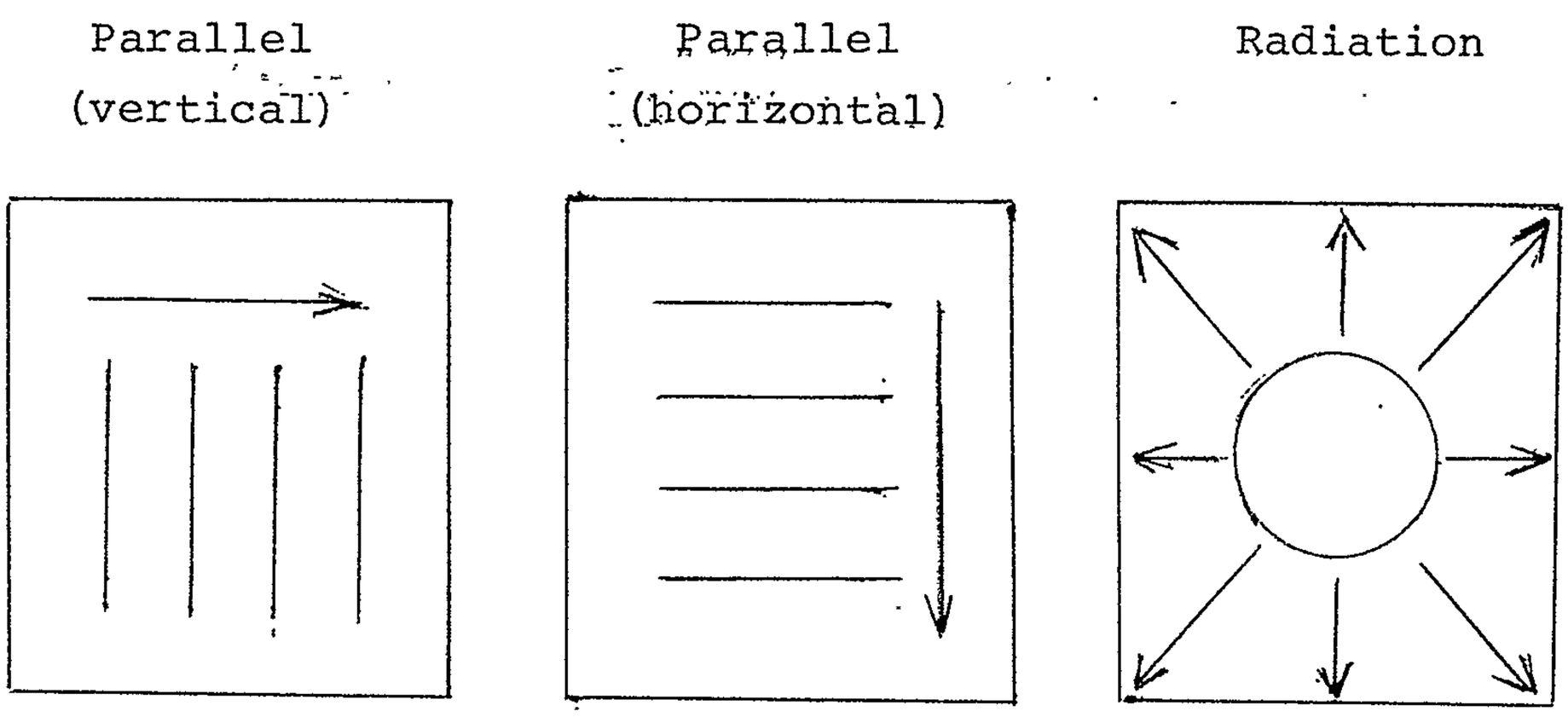
Note that in those questions "I" and "MY" are used in preference to "YOU" and "YOUR".

4.6. Layout

The purpose of the layout is to attract the attention of the audience without confusing them. In order to achieve this the material elements need to be laid out so that the eyes follow a certain track. Below are examples of the layout.

Fig. I : The Layout





4.7. Illustrations

The function of illustrations is to transmit images and messages. For the purpose of dental health education, it has two objectives. One is persuasion aimed at changing behavioural patterns, the second is to inform (Richardson and Brignall[71] 1979). The illustrations provide the impact or initial interest to the message. However, illustrations or pictures are not a universal language. We have to learn to understand illustrations or pictures in much the same way as we learn to speak or read. It is influenced by the environment, the social and cultural background of the group.

The type of illustrations varies from schematic to realistic. Realistic illustrations are more appropriate to substitute for, or replace experience and schematic illustration used to explain or clarify experience (Ewan[26] 1980).

We have mentioned in the earlier chapter that

threatening messages lead to defensive reaction from the audience. Therefore, illustrations should create feelings of self-identification so that the message or impression left behind is personally relevant. For example, beer advertising implicitly projects the warmth and sociability of in-pub drinking, rather than the intrinsic taste of the drink itself (Leathar[60] 1980). Not many dental organisations which produce dental health education materials attempt to project a warm and pleasant impression. Most of the dental health education materials show toothbrush, the act of toothbrushing, decayed anterior teeth and so on. On the other hand, the D.H.E. & R.F. is moving towards projecting positive images in its dental health education materials. An example is the booklet "Your smile says you care for your smile" directed to Australian teenagers. The cover of the booklet projects a pleasant and exciting image in which teenagers would like to be associated with. It shows a young couple holding each other's hands (loving) in a yellow sports car (outgoing), and both are using blue jeans and the boy's shirt is not buttoned (ruggedness).

Another aspect to be considered is that the words should complement the pictures so that it is less easy to misperceive the theme. In some circumstances they can ensure that the message is less threatening and more understanding (Leathar[60] 1980).

The level of information and detail included in an illustration is termed as illustration content. The

illustration content should highlight the essential features of the message. This can be achieved by elimination of unessential detail that distract the crucial aspect of the illustration. It is also important that we avoid the tendency to crowd too much.

4.8. Colour

When properly used, colour has an emotional appeal that could gear the audience to conform to the message. However, it is not mandatory to use colour because it is often expensive and technically difficult to include colour illustrations in printed dental health education materials. Therefore, use colour whenever possible (Ewan[26] 1980).

If you decide to use colour, it seems reasonable to select the colour that resemble the real object or situation. For example, very light yellow (beige) for enamel, bright red for inflammation, dark brown or black for caries and pale pink for gingiva. Smith et al.[83] (1975) caution the use of grey for food or house keeping. Grey in this context suggest dirt. Ewan[26] (1980) pointed out that the use of colour in teaching materials, in most instances, does not contribute to learning and if used indiscriminately may distract the important features. Owen[66] (1962) and Ward[91] (1959) suggested that natural colour should be used in visual aids where practicable and local colour preferences should be investigated.

4.9. Size

A typical poster used as a teaching material for a group of school children will be ineffective due to its small size. Unfortunately, there is no standard size for all situations. As a rule, sit back at the back of the classroom and if you can see the pictures clearly, and read the words easily, then the size of the material is just right. Better still, get a group of school children with the same characteristics as the target group to help you make a decision on the appropriate size of the material for that particular situation.

The relative size of the object should also be potrayed in the illustration. It would be impossible for school children to know the size of the objects unless compared with other objects whose size is familiar to the audience (Dale[19] 1949).

A picture should have the proper amount of detail as pointed out earlier. Therefore, the size of the pictures is dependent upon the amount of detail required. If it is too small, we may not be able to see more than the general outline (Dale[19] 1949).

With regard to the projected image, Ewan[26] (1980) suggested that the optimum size is one which is large enough to discern detail easily and small enough to be taken at a glance.

4.10. Physical quality

The physical quality of the material has an effect

on the interest and motivation of the audience. It also reflects on the enthusiasm, seriousness and preparedness of the educator in performing her function (task). Dale[19] (1949) stressed that the material should be satisfactory not only when purchased but also should be maintained in a satisfactory condition. For example, it is expected that the model retains its form and in working order, the sound quality is excellent and not "croaking", the slides are not cracked and dirty, the materials made from paper are not torn, crumpled or dirty and the colour have not faded.

Materials whose quality have deteriorated should be repaired, or if possible replaced.

4.11 Summary

This chapter dealt with the factors that need to be considered in the evaluation of dental health education materials. I have described these factors, presented some rules in the evaluation of dental health education materials and gave examples of the problems associated with the evaluation.

I have also emphasised that the collection of information regarding the specific target group is of prime importance and forms the basis of the final judgement on the effectiveness of the material.

CHAPTER V

5. DEVELOPMENT OF APPROPRIATE GUIDELINES

This chapter is aimed at bringing together what have been described in the previous chapters. It also includes an outline of the intention of the guidelines. A concise outline of the guidelines will also be presented.

5.1. Discussion

The oral health status of the individual is influenced by his knowledge, attitudes and behaviour in relation to oral health. Therefore, the focus of dental health education, either in the school or community setting, is on people and their oral health activities. Dental health education material, being a component of the dental health education programme, should not be divorced from the total programme. Dental health education materials then should also be directed to changing attitudes or influencing behaviour of the audience in order that they may have an acceptable level of dental health.

In this behaviour-centred approach the dental health education materials used by the dental health educators should be developed with a specific audience in mind and directed to that target group. Knowledge on the characteristics of the specific target group we are dealing with is the primary prerequisite for the design, selection or evaluation of the dental health education materials. The dental health educator need to have

information on the dental health needs of the audience in relation to age, sex and ethnic group, and also taking into account their habits, attitudes, environment, socio-economic status and resistance factors.

In this respect, the fundamental question is: Who is to be educated? The answer is not confined to age, sex and ethnic group but encompass:

- their educational level;
- their needs in relation to dental health;
- cultural background
- social, economic and psychological barriers to behaviour change for that particular group;
- their view of their illness;
- their understanding of previous information about dental health;
- previous use of dental service;
- their beliefs about the outcome of treatment;
- their view of the provider of dental service;
- provision of dental service in the area.

All these information greatly influence the formulation of the programme objectives, the content, language, type of illustration, size and the physical quality of the dental health education material. All these elements are inter-related and together contribute to the general quality of the dental health education material with regard to impact or interest it creates, the nature of information and motivational arousal.

1. Interest or impact relates to the degree to which the audience is psychologically reached, that is whether the overall message holds the attention of the audience exposed to the dental health material. The audience will be psychologically reached when the slogan, phrase, symbol, design, photography, wording or layout appeal to them in the sense that it concerns them and understand the problems involved.

2. The nature of information relates to the degree to which scientific facts concerning dental diseases and the means for prevention by the people's own efforts and actions are understood by them, believable and satisfy their wants or help them in achieving their goals. They must also understand the words, concepts and illustrations used, and most importantly the point of the message.

3. Motivation relates to the degree to which the audience is geared to action to improve their oral health status. All behaviour is motivated (Cinotti[13] 1968) and there are two sources of motivation: physiological needs and social needs. An individual is guided by basic needs (physiological needs) such as satisfaction of bodily wants; and the social needs, that is the desire to receive the

esteem of his fellows (Frame[35] 1968b), such as social acceptance through unmarred smile, "sweet-smelling" breath, youthful appearance and so on.

I have cited in many instances in the previous chapters the effort by the D.H.E. & R.F. in educating the public on dental health. They have put a lot of effort in doing the ground work of gathering relevant information on the specific target groups: the school children, teenagers, adults, expectant mothers, and the Australian Aboriginals. The materials they produced were designed through consultations with "experts" from related disciplines (Wolley[95] 1981) to arouse interest, provide information and motivate the audience by focusing on the elements that I have described. Let us now have a closer look at the dental health education materials produced by the D.H.E. & R.F. from the perspective of interest or impact, information and motivation. For this purpose the booklet "Your smile says you care for your smile" is taken as an example. To arouse interest it uses a catchy slogan with "smile" as the key word rather than "teeth", realistic illustration, the models in the illustrations are in the same age group as the audience, appealing colour contrast, the size of the booklet is big enough to stand out if placed in a magazine rack at the corner of the waiting area, the reproduction of the illustration is excellent and is attributed in part to the quality of the paper.

The information is based on the interest of the target group. The readability of the material (reading age of 9.6 years) is far below the reading age of the group. Technical terms are avoided when possible and explained clearly when no suitable substitute words are available. The illustrations complement the literary information and at the end of the booklet, a brief summary of the key points are included.

The motivational theme is "smile" and relates it to the warm, pleasant and outgoing social environment. This stems from the belief that teenagers are more interested to be physically presentable in their social milieu and will strive to achieve this image. Therefore, the persuasion is positive rather than the reverse as can be seen in many other dental health education materials.

Let us now look into the use of the dental health education materials. The effectiveness of the dental health education material is in part influenced by its appropriate use by the dental health educator. The materials should be used not only to reinforce the message conveyed by the educator but also as a media to get the audience's participation and involvement. This implies that there need to be a two-way communication flow with the dental health education materials as a media to trigger the audience's involvement.

5.2. Intention of the guidelines

The guidelines proposed in this thesis are intended to help dental health educators, particularly dental auxiliaries in Malaysia, to carry out the task of scrutinising the dental health education materials they produced or supplied to them to see whether these meet the requirements with respect to:

1. the general quality of the material from the aspect of interest or impact, information and motivation;
2. the contribution to the learning and teaching process.

I wish to emphasise that:

1. the guidelines is to direct the user to the clue that will lead to the general quality of the dental health education material;
2. a dental health education material cannot be evaluated out of context, which is why the guidelines emphasises taking into account the analysis of the specific target group and the objectives of the dental health education programme;
3. the guidelines can also be used to assist the dental health educator to design, as well as pre-test the dental health education materials;
4. even though these guidelines are specifically directed to dental auxiliaries in Malaysia, I feel that it could also be useful for those

involved in dental health education.

5.3. General outline of guidelines

The general outline of the components from which the evaluation questions will be constructed are presented below.

1. Characteristics of the specific target group.
   This is an examination of a specific group in a social environment. The information required are age, sex, ethnic group, habits, attitudes, environment, educational level, belief, customs and traditions, and the availability and accessibility of the dental services.
2. Objectives:
   - precise;
   - clear;
   - realistic.
3. Content:
   - accurate;
   - current;
   - adequately covered;
   - authoritative.
4. Language:
   - brief;
   - simple;
   - comprehensible;
   - complement illustration.
5. Layout:
   - follow movement of the eyes

6. Illustration:
   - focus on important features;
   - elimination of unnecessary detail;
   - not crowded;
   - realistic.

7. Colour:
   - realistic;
   - local colour preferences.

8. Size:
   - print and illustration are large enough to be seen by the whole group without any difficulty.

9. Quality of the material:
   - in a satisfactory condition.

10. Medium:
   - relates to teaching objective;
   - appeals to as many senses as possible;
   - involvement of audience.

CHAPTER VI.

6. SUMMARY

The world-wide trend towards emphasis and awareness of dental health education, and the nature of the dental health education programmes in Malaysia led to the choice of this topic. It is particularly directed towards dental auxiliaries in Malaysia to assist them in identifying the desirable and undesirable qualities of the dental health education materials so as to improve their effectiveness.

In developing the guideline, several issues in dental health education were noted and discussed. The outcome of the discussion formed part of the content of the guideline.

The approach in the development of this guideline was, in the first instance, to look into the characteristics of the specific target group and the objectives of the dental health education programme, and then relate them to the elements of the dental health education material, namely: content, language, illustration, size, colour, layout, choice of the medium and physical qualities. The decision on the effectiveness of the material is based on the information gathered from the guideline and weighted against the pre-set criteria: interest, information and motivation.

CHAPTER VII

7. CONCLUSION: PRESENTATION OF GUIDELINES

7.1. Instruction

For each item the user can tick the appropriate box and if necessary write a word, phrase or sentence in the space for "Remarks". It is desirable for the user to answer each item in writing irrespective of whether it will be reviewed by others. In certain circumstances it is not possible to answer all the questions because:

1. the item is not applicable;
2. the user is not able to obtain the necessary information.

In this case, the user can still respond by completing in the space "Remarks".

7.2. General Information

Title of material :

Reference number :

Topic/subject :

Date produced :

Evaluator :

Date :

District/State :

Clinic/School :

7.3. Evaluation

1. Situation analysis

What, how and from whom/where do you obtain the information with regard to the target group?

INFORMATION REQUIRED	SOURCE AND METHOD	INFORMATION GATHERED
a. Location	- check with your supervisor	
b. Characteristic of target group		
i. age range	- Teacher - school record	
ii. sex (proportion)	- " -	
iii. ethnic group	- " -	
iv. educational level	- " -	
v. religion	- " -	
vi. culture and traditions relevant to dentistry	- liaise with the supervisor for relevant documents or articles	
vii. socio-economic status	- teacher - school record	
c. Dental background		
i. their dental health needs	- interview a sample of the group	

INFORMATION REQUIRED	SOURCE AND METHOD	INFORMATION GATHERED
ii. previous experience of the group	- interview a sample of the group	
d. Administrative		
i. Dental conditions of group	- Documents from Dental Division	
ii. Dental service in that area	- - " -	
e. Others (specify)		

Remarks:

2. Objectives

a. What are the objectives of the unit of instruction?

b. Are they realistic (achievable)?

Yes ( ) No ( )

Remarks:.....

c. Are they clearly worded?

Yes ( ) No ( )

Remarks:.....

d. Are they precise in terms of desired effect?

Yes ( ) No ( )

Remarks:.....

3. Content

a. Is the content of practical value to the target group?

Yes ( ) No ( )

Remarks:.....

b. Refer to the books, articles and liaise with your supervising officer to determine the following:

i. Is the content scientifically accurate?

Yes ( ) No ( )

Remarks:.....

ii. Is it up-to-date?

Yes ( ) No ( )

Remarks:.....

iii. Are the key points emphasised in the material?

Yes ( ) No ( )

If the answer is Yes, are the key points:

- Too many ( )
- Too few ( )
- About right ( )

Remarks:.....

c. Does the content contribute to the clarification and/or reinforcement of the dental message in commercial advertising or the current topic in the mass media?

Yes ( ) No ( )

Remarks:.....

d. Ask the audience whether the content is simple (easy to understand and follow)?

- Easy to understand but difficult to follow ( )
- Difficult to understand but easy to follow ( )
- Easy to understand and follow ( )

Remarks:.....

e. Is the content compatible and relevant to the target group (similar to socio-cultural values and habits, previously introduced ideas and practices and their needs in general) to warrant their readiness and action?

Yes ( ) No ( )

Remarks:.....

f. Are the audience told specifically when, where and how to follow the prescribed mode of action?

i. Where Yes ( ) No ( )

Remarks:.....

ii. When Yes ( ) No ( )

Remarks:.....

iii. How Yes ( ) No ( )

Remarks:.....

4. Language

a. Using the Fog's Index or Flesh's Readability Index, the language of the material (literature) is:

- too advanced for the target group ( )
- too elementary for the target group( )
- about right for the target group ( )

Remarks:.....

b. Instruct the pupils (from the target group or similar to the target group) to underline the words or technical terms they do not understand. What are those words or terms?

Remarks:.....

Can the words (terms) be replaced with other simpler (popular) words? What are they?

Remarks:.....

c. Are the words relevant to the illustrations?

Yes ( ) No ( )

Remarks:.....

5. Illustration

a. Does it provide an added degree of realism to instruction?

Yes ( ) No ( )

Remarks:.....

b. Are the degree of concreteness and abstraction appropriate to the group learning abilities?

Yes ( ) No ( )

Remarks:.....

c. Does the illustration present real life activities and situations, and characterisations that are meaningful to the target group?

Yes ( ) No ( )

Remarks:.....

d. Are the important feature highlighted?

Yes ( ) No ( )

Remarks:.....

e. Does the illustration seem to look "crowded"?

Yes ( ) No ( )

Remarks:.....

6. Size

a. Sit at the back of the class, and or ask the pupils.

i. Can you (they) read the words easily?

Yes ( ) No ( )

Remarks:.....

ii. Can you (they) see the pictures (illustrations) clearly?

Yes ( ) No ( )

Remarks:.....

b. Are the materials of meaningful scale and proportion?

Yes ( ) No ( )

Remarks:.....

7. Colour

a. Does the material attempt to use natural colours?

Yes ( ) No ( )

Remarks:.....

If the answer is NO, state the colours that need to be replaced?

b. What are the local colour preferences?

Are they being used appropriately?

Yes ( ) No ( )

Remarks:.....

8. Medium

a. Is the medium selected related directly to the teaching objective?

Yes ( ) No ( )

Remarks:.....

b. Does the medium appeal to as many senses as possible?

What are they?

- Vision: Yes ( ) No ( )
- Hearing; Yes ( ) No ( )
- Touch: Yes ( ) No ( )
- Smell: Yes ( ) No ( )

Remarks:.....

c. Does the medium enable the learner to be a partner in the learning process?

Yes ( ) No ( )

Remarks:.....

9. Physical quality of the material

a. Is the physical quality of the material satisfactory?

Yes ( ) No ( )

Remarks:.....

If the answer is NO, what qualities are unsatisfactory?

- Sound ( ) Remarks:.....
- Colour ( ) Remarks:.....
- Unworkable ( ) Remarks:.....
- Dirty ( ) Remarks:.....
- Cracked/ broken ( ) Remarks:.....
- Not clear ( ) Remarks:.....
- Crumpled ( ) Remarks:.....
- Torn ( ) Remarks:.....
- Others (specify)

..... ( ) Remarks:.....

..... ( ) Remarks:.....

b. Can it be repaired to a satisfactory condition?

Yes ( ) No ( )

Remarks:.....

c. Should it be replaced?

Yes ( ) No ( )

Remarks:.....

7.4. Educational judgement

The criteria for evaluating the effectiveness of dental health education materials, in this instance, are: interest, information and motivation.

Interest: Does the medium (material) attract and hold the interest of the audience?

Information: Does the material assure that the content are authentic and authoritative, and the purpose are understood?

Motivation: Does the method assure the transformation of knowledge to action?

Taking into consideration your responses to this evaluation tool and the pre-determined criteria, is the material:

- APPROPRIATE ( )
- USABLE ( )
_ UNSUITABLE ( )

General remarks:.....

.....

.....

APPENDIX I: DUTIES OF DENTAL NURSES IN MALAYSIA

(Johari [50] 1979, Nasir[65] 1981)

I. Restorative

a. Standard cavity preparation and silver amalgam fillings in permanent teeth.

b. Standard cavity preparation and silver amalgam fillings in deciduous teeth.

c Silicate fillings on permanent anterior teeth, except Class IV cavity preparation.

II. Extraction

a. Extraction of deciduous teeth using infiltrative or topical anaesthesia.

III. Preventive

a. Topical application of fluoride solutions and/or other preventive measures as recommended by the Dental Division, Ministry of Health, Malaysia.

b. Oral prophylaxis.

c. Complete patient examination.

IV. Promotive

a. Organises and provides oral health education to children and adults, individually or in groups, taking into consideration their socio-economic background, cultural and sub-cultural differences, taboos and educational level, and using educational aids appropriate for the situation and condition.

b. Provides chair-side instruction on oral hygiene.

V. Others

a. Relief of pain in the form of dressing.

b. Pulp capping for accidental exposures only.

c. Treatment of very simple gum conditions, for example, marginal gingivitis, by scaling and polishing.

d. Referrals of those cases beyond their capability to manage to the nearest Main Dental Clinic.

APPENDIX II: DUTIES OF DENTAL SURGERY ASSISTANT

(Johari[50] 1979)

1. Reception and secretarial duties which involves fee collection, issuing of receipts, maintenance of record of patients, and communication with patients.
2. Sterilisation of materials, instruments and equipment for intra-oral procedures.
3. Assisting dentist (including the specialist) in the surgeries at the chairside.
4. Accompanying the dentist on travelling duty, for example, mobile-van and mobile-squad duties.
5. Responsible for fetching schoolchildren to and from schools for treatment.
6. Responsible for the cleanliness and maintenance of operatories, inventories, etc., in the surgery.
7. Preparation of monthly returns.
8. Preparation of health education materials.
9. Any other duties assigned by the dentist or her supervisor from time to time.

APPENDIX III: READABILITY FORMULA

1. Fog Readability Index (Gunning[40] 1952, Blinkhorn and Verity[5] 1979)

   a. Select systematically samples of 100 words.

   b. Determine the average sentence length, i.e. divide the number of words by the number of sentences.

   c. Determine the percentage of hard words by counting the number of words with three or more syllables.

   d. Fog Index = (Average sentence length + Percentage of hard words) x 0.4.

   e. Add 5 to the Fog Index to give reading age.

2. Flesh Readability Formula (Flesh [30,31] 1964, 1949)

   a. Pick samples of 100 words.

   b. Determine the average sentence length.

   c. Count the number of syllables in the samples.

   d. Flesh readability formula:

      - Multiply average sentence length by 1.015 ..... Y .....
      - Multiply the number of syllables per 100 words by 0.846 ..... Y .....
      - Add X and Y ..... Z .....
      - Subtract Z from 206.835 to obtain "reading ease" score.

Description of style	Reading Ease Score	Estimated Reading Grade
- Very easy	90 to 100	5th grade
- Easy	80 to 90	6th grade
- Fairly easy	70 to 80	7th grade
- Standard	60 to 70	8th & 9th grade
- Fairly difficult	50 to 60	10th to 12th frade
- Difficult	30 to 50	13th to 16th grade (high school)
- Very difficult	0 to 30	College graduate

APPENDIX IV: AVERAGE READING AGE FOR SELECTED WORD SAMPLES FROM POPULAR PRESS PUBLICATIONS AND DENTAL HEALTH EDUCATION LITERATURE (Blinkhorn and Verity[5] 1979)

MATERIAL	READING AGE IN YEARS	AVERAGE
- Womans Own	13.3	
- Woman	14.6	13.4
- She	12.3	
- Daily Express	12.4	
- Daily Mirror	12.1	12.0
- Sun	11.5	
- Times	18.8	
- Observer	15.4	16.4
- Daily Telegraph	14.9	
Health Education Council		
- You and Your Toothbrush	14.8	
British Dental Association		
- Milk Teeth Matter	13.0	
- Stop the Rot	12.4	
Oral B		
- Why Clean Your Teeth	14.6	

MATERIAL	READING AGE IN YEARS	AVERAGE
S.S. White		
- Good Dental Care can be Child's Play	17.4	

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