DOCUMENT RESUME

ED 086 797 CE 000 799

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TITLE Preventive Dental Practices Motivational Model for Elementary Teachers in Training Institutions; Dental Health Instruction Project. Final Report.
INSTITUTION Ball State Univ., Muncie, Ind.
SPONS AGENCY National Institutes of Health (DHEW), Bethesda, Md. Div. of Dental Health.
PUB DATE Aug 73
NOTE 119p.

EDRS PRICE MF-$0.65 HC-$6.58
DESCRIPTORS *Behavioral Objectives; Behavior Change; Behavior Patterns; Dental Evaluation; *Dental Health; Educational Objectives; *Educational Programs; *Education Majors; Models; *Program Effectiveness; Teacher Education

ABSTRACT

An investigation was conducted to determine the effects of instruction upon the dental health behavior of university students. The experimental group of 68 subjects, all elementary education majors, were exposed to a three--stage dental health motivational model: Dental Health Skills Instruction (four hours of laboratory instruction), Cognitive Dental Health Instruction (three hours of classroom instruction, less formally presented), and Dental Health Affective Instruction (three hours of informal participatory instruction). Ninety control subjects, also elementary education majors, received less concentrated instruction. The Patient Hygiene Performance and the Dental Health Center Index were used to detect oral health changes, and thus, the effectiveness of the model. Results of baseline, after instruction, and follow-up examinations showed a temporary improvement in both groups after instruction, the experimental group recording more improvement: but follow-up examinations showed regression toward baseline levels and no significant difference between the two groups. The document devotes approximately twenty pages to program instructional procedures and about fifty pages to supportive education materials, including a dental skills lab manual and a self-report dental behavior inventory. Program factors and related manuscripts are also included. (AG)

FINAL REPORT

DENTAL HEALTH INSTRUCTION PROJECT

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AUGUST 1973

(NIH - 72-4295)

(BSU - 2646)

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PREVENTIVE DENTAL PRACTICES MOTIVATIONAL MODEL FOR ELEMENTARY TEACHERS IN TRAINING INSTITUTIONS

The motivational teaching model in this project focuses upon dental skills, cognitive behavior, and the application of these skills and behaviors. The model has three (3) phases--Dental Health Skills Instruction, Cognitive Dental Health Instruction, and Dental Health Affective Instruction. The model starts with formal, controlled laboratory instruction in Phase I, classroom instruction in Phase II, and ends with informal, participatory instruction in Phase III.

Phase I, skills instruction, contains four (4) classroom hours. During this phase, toothbrushing, flossing, disclosing and recording skills are taught in a formal laboratory setting. The instructor determines the skills and instructional behaviors--the class is instructor oriented. Skills are emphasized and cognitive information is only generally discussed. Students are motivated by qualifying for home-use dental materials and are evaluated by their level of skill performance.

During the three (3) hours of Phase II, cognitive instruction, the instructor and the students determine the classroom behavior. The climate is less formal than in Phase I and information is disseminated to the students regarding the reasons and rationale for the elicited skills. Dental health conditions are presented to create internal dissonance and/or make the students feel susceptible to dental disease. Individual material reinforcement is replaced by group reinforcement and the reinforcement becomes non-continuous and non-material.

Phase III, affective instruction, is characterized by student-determined behavior for three (3) classroom hours. The classroom climate is informal and the students are organized into small groups to experience affective activities. Stress is generated and the most effective alternative for the students to reduce the stress level is to practice the control behaviors. The instructor isolates the real reasons for not exhibiting control behaviors and then encounters the students. Students that are eliciting the control behaviors would not be uncomfortable and in most instances would assist the instructor with facilitation. During this phase the students make a personal commitment to one another and themselves regarding the dental behaviors they will adhere to for the next ten (10) weeks.

The principles of operant conditioning theory are used during skills and cognitive instruction. The following procedures are used to motivate the students to achieve the objectives.

1. Internalization: Qualified students initially receive material, and then later, non-material reinforcement.

2. Performance-based: Performance-based objectives give the students many opportunities to qualify for reinforcement.

3. Immediate Feedback: Reinforcers are provided to the students immediately after appropriate responses are elicited.

4. Contingencies: Student reinforcement moves from individual to group contingencies.

5. Scheduling: Reinforcement scheduling is continuous followed by a variable ratio to avoid satiation.

In the Affective Instruction Phase, principles related to human and group dynamics are utilized to motivate the students to transfer these new behaviors to their daily dental repertoire. The following

principles were included to integrate the affective and cognitive instruction:

1. Non-judgmental: Negative feelings of students such as "bored, apathy, and silly" are as permissible as positive feelings such as "involved, interested, and important."

2. Relevant: Students learn what is relevant to them; although all will not learn everything, the instructor hopes the students will learn what is presented for themselves.

3. Openness: Students learn and transfer more when the classroom climate and the relationship with the instructor are open, honest, and comfortable.

4. Risk-taking: Students get more satisfaction from an experience or situation if they take more risks--high risk, high satisfaction. Students change after experiencing change, and if you can not change, it is impossible to change others--higher risk, more change.

5. Commitment/Actualization: Students committed to intelligent and self-fulfilling action will perform the new behaviors for themselves. Actualization occurs when the new behaviors become an integral part of the student's personal value system and they transmit these values to their family and friends.

The curricular design in this model includes objectives (skill, cognitive, and affective), instructional information, affective activities, evaluation, and instructional strategy. The objectives are behavioralized, i.e., they are stated explicitly and in student terms. The instructional information reinforces the objectives by operationalizing exactly what the student must do in order to fulfill the objectives. The evaluation quantifies the instructional objectives so that the

instructor can determine if the objectives have been reached or approximated. Affective activities are used to accomplish the affective objectives. The instructional strategy details (as much as practical) what the instructor does in the lab and classroom in order to elicit the behaviors cited in the objectives.

This ten (10) classroom-hour instructional model combines skill, cognitive and affective experiences in dental health. An integration of the skills and cognitions with affective reactions promote positive feelings and improved values regarding dental health. This process increases the probability of transference that is necessary to instructionally modify health behavior.

PHASE I

DENTAL HEALTH SKILLS INSTRUCTION

Objectives

A. Skill

As a result of instruction, each student will be able to demonstrate:

1. their ability to observe and record plaque on the M-PCR.
2. the Bass method of brushing.
3. proper flossing procedure.
4. plaque removal and control skills.

B. Affective

During instruction each student will:

1. evaluate self and others in terms of skill development and involvement-commitment.
2. give and receive feedback on skill expertise in terms of dental health care and personal involvement.

Instructional Information

A. Flossing Procedure

1. Cut off a piece of floss approximately three (3) feet long.
2. Wrap the floss lightly around the middle fingers at the lower joint.
3. Use thumbs for upper teeth and forefingers for lower teeth. (Thumb and forefinger for front interproximal areas.)
4. The area of floss to be used should be approximately 1/2 inch and not more than 3/4 inch.
5. Start with distal areas at the end of each arch.

6. Gently slide the floss between the teeth with a sawing motion. (Caution: Do not "pop" the floss from the contact point into the open space.)
7. Contour the floss around each tooth and move the floss up and down on each tooth until it is "squeaky" clean. (Notice the floss disappearing under the gingival margin.)
8. Move to clean sections of floss by turning from one middle finger to the other.
9. Rinse mouth with water.

B. Bass Method of Brushing

1. Do not use this method of brushing with a hard bristle brush.
2. For the outside surfaces of all teeth and the inside surfaces of the back teeth hold the brush horizontally with the bristles at the junction between the teeth and gums.
3. The brush should be on a 45° angle toward the gum line. (Observe this procedure in Floxite mirror.)
4. Brush no more than two teeth at one placement. (7-8 placements/jaw; 8-10 strokes/placement)
5. Brush gently with a short "back and forth" vibratory motion—hold the brush with tips of fingers.
6. For the inside surfaces of the upper and lower front teeth, hold the brush vertically and make several gentle "back and forth" strokes over the gum tissue and teeth.
7. Brush "back and forth" on biting surfaces.
8. Rinse with water.

C. Disclosing and Recording Procedure

1. Tilt head back, open mouth, and withdraw tongue.

2. Have a partner place six (6) drops of disclosing solution under your tongue. (NOTE: This solution will stain lips and hands for approximately four (4) hours; if you do not desire stain on your lips, use Chapstick. The stain washes from clothing with cold water.)
3. Allow solution to remain in the mouth for fifteen (15) seconds or until saliva accummulates.
4. Forceably swish the solution around the mouth and rub the tongue over all tooth surfaces.
5. Swallow the remaining solution or expel into the sink.
6. Do not rinse mouth until the recording is completed.
7. Observe all tooth surfaces with mirror and reflector.
8. Cross off missing teeth.
9. Note dark pink (stained) areas on tooth surfaces—this indicates plaque.
10. Shade these corresponding tooth surfaces with red pencil on the Modified Plaque Control Record (M-PCR).
11. Count the number of shaded areas and record.
12. After lab instruction, circle stained tooth surfaces that were not removed.
13. Record the number of circled, stained tooth surfaces.
14. Repeat flossing and brushing if necessary.

Evaluation

1. Dental Skills Lab Evaluation

The instructor observes the students demonstrate plaque-removing skills of flossing and brushing in the lab. Specifically, in the area of flossing, the instructor observes: (1) preparation procedure, i.e., cutting of approximate amount of floss, wrapping correctly, and exposing

the 1/2 inch of floss; and (2) execution, i.e., flossing distal areas, each interdental space, sawing and sliding the floss into place, and contouring floss around each tooth and making each tooth "squeaky" clean. In the brushing area, the instructor observes (1) proper position of the brush, (2) using short back and forth vibratory strokes, and (3) number of placements of the brush. Students experiencing difficulty are assisted by the instructor.

The instructor also observes the students using disclosing solution and identifying plaque. The students, working in groups, are observed for (1) complete and proper staining procedure, (2) their ability to identify all areas of the mouth with the lighted mirror and reflector, (3) their ability to identify plaque in their own mouths and (4) in the mouths of their peers.

2. Modified Plaque Control Record

Modified Plaque Control Records (M-PCR)[1] are provided for each lab period. The students' ability to demonstrate plaque removal skills is evaluated by the completion of these forms. When the acceptable plaque level for the lab period has been achieved by the student, it is verified by the instructor at an exam station. Students with unacceptable plaque levels must re-attend to the plaque removing skills, re-disclose and verify the achievement of an acceptable level of plaque. Individual lab periods are arranged for students that did not achieve the performance level.

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[1] See page 47.

Instructional Strategy

Lab I (1st Hour)

Large group instruction: Students are provided with disclosing solution (Trace); dental reflector; Floxite mirror and lamp; Mynol plain applicator; Oral B30 toothbrush; red pencil, and a Dental Skills Lab Manual.[2]

1. Instructor Introduction
   a. Statement regarding dental health behaviors as being the instructor's values; these vlaues may or may not become a part of your dental health value system.
   b. General lab procedures stated.
   c. Lab I Outline summarized.
2. Slide presentation (see p. 61) and instructor demonstration of disclosing and observing.
3. Students disclose and record self on the M-PCR.
4. Instructor observation: Students observe all tooth surfaces with mirror and reflector and identify plaque in their own mouths.
5. Instructor observation (Exam Station): Students demonstrate their ability to record plaque on the M-PCR. M-PCR's are collected. Students completing the objective successfully are given a toothbrush for home use. Students with areas of unrecorded stained surfaces are asked to re-observe and are re-checked later.
6. Students brush away stained areas with lab provided brush. (No instruction)

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[2]See pages 34-47.

Lab II (Procedures)

1. Large group: Instructor presentation of brushing technique. Slide and verbal presentation, then Lab II outline summarized.
2. Students disclose and record self on the M-PCR.
3. Small group instruction (7-10 students/group) of brushing technique on dentiform.
4. Students demonstrate Bass brushing technique.
5. Instructor observation: students demonstrate brushing technique on self.
6. Students re-disclose.
7. Instructor observation (Exam Station): Students reduce the amount of plaque to 3-4 surfaces. Reinforcer: disclosing solution.
8. Students hand in M-PCR.
9. Small discussion groups on an affective activity. Students give reactions (one-two words) to Lab I on 3 x 5 cards.

Lab III (Procedures)

1. Large group: Instructor presentation of flossing. Slides and verbal explanation, then Lab III outline summarized.
2. Students disclose and record partner.
3. Instructor observation: students examine and record the M-PCR on their partner.
4. Small group instruction of flossing on dentiform, then student participation of technique.
5. Students floss and instructor observation of students' demonstrating flossing technique.
6. Students brush and re-disclose.
7. Instructor observation (Exam Station): Students reduce the amount of plaque to 1-2 surfaces. Reinforcer: floss.

8. Students hand in M-PCR.
9. Small discussion groups (Affective Activity). Students compare Lab I reactions with Lab III reactions.
10. Instructor facilitation and summary Affective Principle I.

Lab IV (Procedures)

1. Lab IV summarized.
2. Students floss and brush within a 15-minute period.
3. Students disclose and record.
4. Students re-brush, re-floss, and re-disclose (if necessary).
5. Instructor observation (Exam Station): Students must reduce their plaque level to zero. Reinforcer: mirro-lite.
6. Students hand in M-PCR.
7. Small group and total class discussion regarding their reactions about dental health behaviors of themselves and others.
8. Instructor facilitation Affective Principle II.

PHASE II

COGNITIVE DENTAL HEALTH INSTRUCTION

Objectives

A. Cognitive

As a result of instruction, the student will be able to:

1. define plaque and list the products of bacterial activity.
2. explain the relationship of bacterial plaque to periodontal disease and dental caries.
3. identify the principle reasons why the identified control behaviors of brushing, flossing, and disclosing are necessary and more effective than traditional techniques of oral hygiene.
4. list the etiology, symptoms, and ramifications of carious lesions and periodontal disease.
5. name descriptive statistics related to the incidence of dental disease.
6. describe the role of the elementary classroom teacher and the basic components of an effective dental health instructional program.
7. explain the importance of fluoridation and nutrition in dental health and their relationship to reducing dental caries.

B. Affective

During instruction each student will:

1. communicate openly and honestly with the instructor.
2. realize that his personal feelings, values, attitudes, and behaviors are worthy in the classroom.
3. feel susceptible to dental diseases and modify control behaviors on their personal value continuums.

4. realize that though the instructor and himself may differ on goals, values, feelings, attitudes, etc., each can learn from the other and respect the other.

Instructional Information

A. Bacterial Plaque

1. Plaque is a soft, tenacious, colorless adherent bacterial deposit which forms on the surface of teeth.

2. Plaque causes cavities and periodontal disease which is a disease that destroys the tissues surrounding the teeth, the gingiva, the bone, and the periodontal fibers.

3. Plaque is composed of several different substances that can be divided into two general groups:

   a. The first group includes all the various kinds of bacteria that are normally present in the mouth: bacilli, cocci, spirilla, etc.

   b. The second group includes the products of bacterial action. The acids cause tooth decay. The toxins or poisons help to cause periodontal disease. The dextrans, which are gooey sticky substances, hold the bacteria, acids and toxins next to the teeth and gingiva.

4. Calculus (tartar) is formed when plaque is not removed regularly. These hard deposits must be removed by dental instruments.

5. Bacteria in plaque begin producing acid within a few seconds after a person eats any food which contains sugars. Once started, acid production usually continues for long periods of time, thereby prolonging destructive action long after the time sweets are actually in the mouth.

B. Rationale for Bass Brushing, Flossing and Disclosing

1. Sufficient evidence exists to indicate that there is a direct association between the presence of bacterial plaque and dental disease. And, the removal of bacterial plaque through adequate oral hygiene reduces the incidence of dental caries and periodontal disease.
2. The conscientious and correct application of a brushing method is more important than the method itself. The Bass method of brushing is particularly effective in cleaning the coronal surfaces of teeth and the free gingival margin where bacterial plaque most often accumulates.
3. Because there is no evidence that proper, more frequent brushing is harmful to the teeth or gingiva and because individuals vary in their efficiency of brushing, it is not necessary to place an upper limit on the frequency of brushing. Enough evidence is at hand, however, to justify suggesting at least two brushings daily; however, the complete removal of bacterial plaque by brushing and flossing will prevent the reorganization of bacteria colonies for 24 hours.
4. In most people, periodontal disease starts in the gingival tissues between the teeth. A brush cannot effectively clean these areas or behind the last tooth in each arch.
5. Dental floss, either waxed or unwaxed, properly employed, will effectively clean almost all proximal surfaces. Unwaxed floss has exposed fibers which will remove the plaque easier than waxed floss.

6. The use of disclosing solutions containing harmless food dyes that stain dental plaque red has been advocated as a helpful adjunct to oral hygiene. Using disclosing solution is the only way an individual can verify the effectiveness of his brushing and flossing skills.

C. Diseases of the Teeth and Gums

1. Dental caries: caries begins with a small hole, usually in a fissure or flaw of a tooth, in an area where food may become lodged, or where it is difficult to remove food. Unless small cavities are filled, the decay will penetrate the dentin. Decay progresses rapidly in dentin because it is softer than enamel. When decay reaches the pulp, the blood vessels and nerves become infected and an abscess will probably form. There is usually soreness, pulsating pain, and swelling with the abscess.
2. Gingivitis: gingivitis is the first stage of periodontal disease. The gigivae become inflammed - the are red, puffy, and may bleed easily.
3. Periodontal Disease: gingival inflammation spreads and the gum withdraws from the tooth forming a pocket which fills with bacteria and pus. Eventually the bone supporting the teeth is destroyed resulting in tooth loss. It is a slow, creeping, virtually painless infection in the developing stages; a disfiguring disease when advanced.
4. Halitosis: the primary cause of halitosis, or bad breath, is lack of proper oral hygiene. Other causes of halitosis are infected teeth or gums, periodontal disease, and stomach disorders.

D. Descriptive Dental Disease Statistics

1. Dental Caries:

a. The most common physical defect found in school-age children and youth is dental caries.

b. Fifty percent of all 2-year olds have 1 or more carious teeth.

c. Ninety percent of the children in the United States have dental decay by the age of 4 years.

d. By the age of 5 years, children have 3 or more decayed temporary teeth.

e. Less than 4 percent of the high school pupils are free of dental decay.

f. By the age of 16 years the average youth has 7 decayed, missing or filled teeth involving 14 tooth surfaces.

g. High school youth average 2-3 new cavities per person per year.

h. Among adults, aged 20 to 35, there are from 13-20 teeth per person which are affected by dental decay.

2. Periodontal Disease:

a. Sixty percent of young adults have periodontal disease; so do 80% of the middle-aged and 90% of those over 65. And though it is usually considered an adult disease, approximately 40% of adolescents suffer from periodontal disease in its more destructive stages.

b. By the age of 36 years, 1 in every 5 persons needs dentures.

c. By the age of 55 years, 1 in every 2 persons needs dentures.

d. 75-80 percent of persons over 65 years of age are edentulous (without natural teeth).

e. Approximately 20 million Americans, 1 in 10, are edentulous.

3. General Diseases of the Mouth:

   a. Every year, there are some 23,000 new victims of oral cancer, and malignant tumors of the mouth cause about 4,000 deaths annually in this country.

   b. Sixty percent of American children have orthodontic conditions serious enough to warrant corrective treatment. For 20% of these, the condition is severe. (Severe, in this context, means deforming or crippling.)

   c. A single measure of dental neglect—the armed forces must fill 850 tooth surfaces, extract 101 teeth, and provide 59 bridges and dentures for every 100 men they accept.

E. Preventive Dentistry and Education

1. Nature of Problem

   a. Although most dental decay occurs in the growth period between 12 and 18 years of age, it has been estimated that one-half of the population under the age of 15 has <u>never</u> been to a dentist.

   b. For the age group 5-14, 27.6% of the children have never been to a dentist.

   c. Reports indicate that more than 40% of dentists do not routinely attempt to teach oral hygiene to patients in their offices or to the public through community health programs.

   d. Individual patient instruction and education: 10% of 1,000 dental patients who completed a questionnaire reported that they had received mouth-care instructions from a dentist.

2. Rationale for Inclusion in Education

   a. Education is compulsory for all children and educators have daily contact and influence upon the children.

   b. Educators are skilled in the selection of instructional strategies and motivational procedures that are necessary to change behavior.

   c. Control behaviors are within the domain of the classroom educator and behaviors are more easily conditioned to habit in lower elementary grades.

   d. In the past school dental health education was based upon the premise of identifying and referring problems; new premise--anticipate problems and prevent them through a dental disease control program.

3. Effective Dental Health Instruction

   a. Instruction is necessary in the three (3) domains of skills, cognitive, and affective.

   b. Principles of operant conditioning and human dynamics must be integrated into the instruction.

   c. The teacher must be motivated and practicing the behaviors that are being taught. (We change after experiencing change and if the teacher can't change it will be impossible for them to change others.)

   d. Feedback and accountability systems must be used to check the behaviors during the instructional process; alternative strategies should be available.

   e. Disease concept should be emphasized in lieu of an unclean mouth; it is socially acceptable to have a disease, but not unclean or unhygienic. Plaque is a disease; it is the incipient stage of dental disease.

4. Advantages of Dental Health

   a. As well as enhancing appearance, teeth influence facial expression, contribute to the contour and tone of facial musculature, allow for normal speech, and initiate the nutritional processes by preparing food for digestion.

   b. Clean and healthy teeth contribute to emotional health through increased self-esteem and self-confidence.

   c. Economic advantages.

Evaluation

Dental Health Cognitive Test

Dental Health Cognitive Tests[3] were used to evaluate the information disseminated during Phase II instruction. The multiple choice questions test the student's knowledge related to: bacterial plaque; rationale for Bass brushing, flossing, and disclosing; diseases of the teeth, gums and mouth; descriptive dental health statistics; nutritional aspects fluoridation; and preventive dentistry. Questions were formulated at the knowledge, comprehensive, and application levels according to Bloom's Taxonomy - Cognitive Domain.

Test Day Procedures

1. A test is given to students during the first segment of the class.
2. The tests are corrected, returned, and reviewed during the second segment of the class.
3. Students not content with their score may retest on their own time within 48 hours (two school days) after the test and select the better score for evaluation purposes.

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[3] See pages 53-60.

4. Retesting students receive an alternate form of the test.[4]
5. This process provides immediate feedback and emphasizes learning and not grades.

Instructional Strategy

Cognitive I (5th Hour)

Large group instruction.

1. Self-Report Dental Behavior Inventory[5] is presented to students, a tear-out is completed by the students.
2. Class Floss - Students are invited to floss during lecturettes, important information is included in handouts.
3. Plaque Lecturette
   a. Transparencies depicting simple equations as to the cause of dental caries and periodontal disease is presented.
   b. Motile bacteria is shown from microscope to TV monitors.
4. Comparison of Hygienic Techniques (Slides) shows stained tooth surfaces after brushing with traditional method and comparison after Bass and Floss Technique is used.
5. Detergent Food Slides.[6]
6. Affective Activity--Students are asked how they felt about completing the Self-Report Dental Behavior Inventory.

Cognitive II (6th Hour)

1. Collect S-R DBI

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[4] See pages 57-60.

[5] See pages 48-52.

[6] See pages 61-63.

2. Class Floss

3. Dental Disease Lecturette

   a. Dental Caries (Slides)

   b. Periodontal Disease (Slides)

   c. Statistics re: Periodontal disease and flossing - Transparency

4. Diseases of the Teeth, Gums, and Mouth[7] handout disseminated to students.

5. Results of S-R DBI from the previous day. (Transparency)

6. Affective Activity--Feelings and reactions about lecturettes.

Cognitive III (7th Hour)

1. Collect S-R DBI

2. Class Floss

3. Return first - fourth day M-PCR's (comparisons are shown)

4. Results of S-R DBI (Transparency)

5. Periodontal Disease (Slides)

6. Announce Group Contingency, i.e., a reinforcer provided for an average percentage of brush, floss, and disclosement of .80. (checked via S-R DBI at random during the next 3-4 days) Students are first asked if they want to have this type of an activity and what percentage would be amenable.

7. Preventive Dentistry and Education Lecturette

8. The Importance of Nutrition and Fluoridation in Dental Health[8] handout disseminated to students.

9. Affective Activity--Integration of Principles

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[7] See pages 64-67.

[8] See pages 68-73.

PHASE III

AFFECTIVE INSTRUCTION

Affective Objectives

During instruction each student will:

1. become acquainted with the theoretical concepts and practical methods of self-evaluation, group support, and personal relationships.
2. utilize concepts and methods to form a closer relationship with class group members.
3. identify their actual and ideal dental health behaviors in terms of their attitudes and values.
4. select a personal dental behavioral commitment that is comfortable and practical for themselves.
5. through instructor facilitation and self-analysis, identify problems and personal characteristics that prevent them from reaching their values.
6. form a supportive relationship with one other student which will promote the carrying out of their personal commitment in dental health.

Affective Activities and Alternatives

Affective activities are initiated for a few minutes at the beginning or end of class in Phase I. During Phase II, affective activities increase in both time allotment and intensity. In Phase III, the activities occupy the entire class period. The instructor should be familiar with a variety of activities and utilize

the activities that are appropriate for the classroom climate at the time. In this section of the curricular guide, activities and alternates are presented that will fulfill the affective objectives.

An Affective Questionnaire[9] was designed to give the instructor feedback (if needed) regarding the achievement of the affective objectives. One sheet is organized for each day of affective activity. If the students feel the instructor is "not concerned" or "very closed" or the affective activity is "worthless" or "of no importance," similar activities and group discussion are used to isolate the problem and generate alternative actions. The problem must be identified and solved before skill and cognitive information can be integrated with affective reaction to change behavior. During the instructor summaries, the instructor should relate the affective experiences to dental health. This facilitates the integrative process.

I. Skill Instruction Activities

Principle I (Non-judgmental) and Principle II (Relevant):

A. 1. Small groups (triads): Students talk about what they learned and how they felt.

2. List similarities and differences on newsprint or 3x5 cards. (1-3 items)

3. Students express what is important to themselves. Respect each other's relevance.

4. Instructor summary - need for individualization.

B. 1. Each individual writes down on a piece of paper: (1 minute, 2-5 words):

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[9] See pages 74-79.

a. How important is dental health to me?

b. How do I feel about my dental health behavior in light of what I have just experienced?

2. Dyads or triads form to discuss similarities and differences in their feelings. (3 minutes)

3. Triads list on newsprint those things that made sense that they learned today. (2 minutes)

4. Group discussion and instructor summary.

C. 1. Give each group of 5-6 students one piece of newsprint and a magic marker.

2. Each person writes down one one-word feeling they have now. (15 seconds)

3. Have group relate those one-word feeling statements to either:

a. this class today (e.g., lab, instructor, how it was run, etc.)

b. their own dental health

4. Group discussion and instructor summary.

D. 1. Each student stand and walk around; takes 2 minutes to find one object that best describes his feelings, reactions, or learnings of the day.

2. Students pair with one other person and share why they chose each object.

3. Instructor summary.

II. Cognitive Instruction Activities

Principle III (Openness):

A. 1. Small groups (5-6 students) All close eyes.

2. Re: S-R DBI What does the prospect of filling it out make you feel like? Describe it with your right hand.
3. Open eyes. Discuss in groups. Talk about how they felt; why they did what they did.
4. On 3 x 5 card write how you feel about filling out the S-R DBI.
5. Instructor summary - discussion regarding Principle III

B. 1. Small groups: Each person thinks to self about one change they would make in class. Write it down.
2. Each person shares with group the change he'd like.
3. Group discusses:
   a. have you shared this with anyone before?
   b. why have you not talked about it?
   c. how could your group make sure the changes occur?
4. Instructor summary.

C. 1. Small groups or triads.
2. Read article on "Constructive Openness"[10]
3. Paraphrase other's comments about you to make sure you understand them as he intends them.
4. Discuss what keeps them from being "constructively open" with others (e.g., those people in the group)
5. Instructor summary.

D. 1. Small groups (5-6) Each person writes down one thing about self they've never told anyone. (Some will write a lot, some nothing.)

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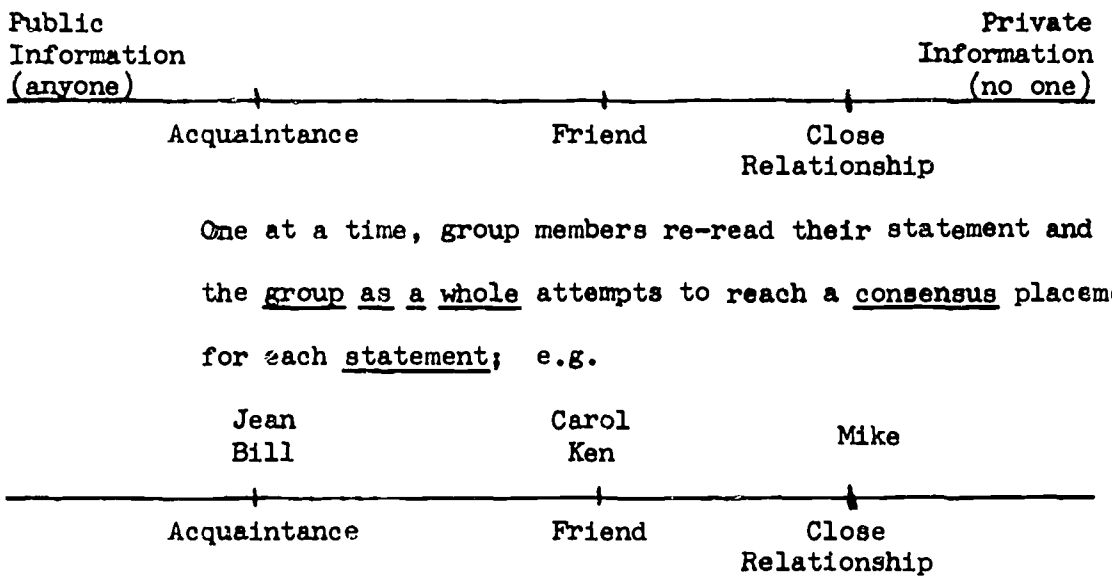
[10]See pages 80-81.

2. Each person reads his aloud (if he has something).

3. Hand out the form below (one to each group)



One at a time, group members re-read their statement and the group as a whole attempts to reach a consensus placement for each statement; e.g.

4. Instructor suggests each group discuss the following:

   a. What has been revealed about the trust level in this group?

   b. What can your group do to elevate the level of trust?

   c. What behaviors tend to lower the trust level in this group?

5. Instructor summary.

E. 1. In small groups: how honest are you with (a) feedback, (b) looking at self, (c) rating self (one minute; share with others)

2. Is this where you want to be?

3. If no, what would you like to have done? (If no, how/when could you have been more honest?)

4. What about you keeps you from doing what you'd like to do rather than what you do?

5. Instructor summary.

F. 1. Same or different groups: mark self on honesty continuum

a. where the students are now (N = Now)

b. where they'd like to be (L = Like)

Slightly Honest N L Very Honest

2. Describe what your behaviors would look like at each point.

3. What keeps you (what about you) from being where you'd like to be?

4. Instructor summary.

III. Affective Instruction Activities

Principle IV (Risk-taking):

A. "High risk, low risk" - Hand out risk-taking handout[11] in completed, explained form.

1. Groups of 5-6: talk about "where am I" in general with people. Where am I with new experiences? (Ex: first date, first day at college, first auto accident, etc.)

2. Determine where they would LIKE to be with each new experience.

3. Instructor summary.

B. 1. In groups of 4 or 5 with people you have had some contact with, stand in a circle.

2. Give them your first impression of them one at a time.

3. Hand out unfinished risk continuum and have each person locate how much risk they took with each other person in the group.

Low Risk Lynn Bill Mike Jean High Risk

[11] See page 82.

4. Share your continuum with people in the group.
5. Discuss why there were differences as to where you rated your own risk-taking: (1) within you; (2) within individuals.
6. Hand out complete risk-continuum for personal insight.
7. Instructor summary.

C. Small groups - anybody

1. Hand out completed risk-taking form.
2. Have students discuss what it means.
3. Locate yourself "in general" (How you are most of the time)
4. Discuss how where you put self in general compares to where you are in this class.
5. Instructor summary.

D. First Impressions

First impressions are important in communication in that they may be largely responsible for determining whether and to what extent people will communicate with each other. It is important for us to know whether others see us as we see ourselves.

In small groups offer your first impressions verbally to any member or members of the group. Those on the receiving end simply receive, making no comment regarding the first impression offered.

1. What non-verbal communication accompanied the verbal comments?
2. How accurate were the first impressions given to you as an individual in terms of the way you see yourself?
3. In terms of communication with others, is it important how great the discrepancy is between the way you see yourself and

the way others see you? Why?

4. Instructor summary.

Principle III (Openness) and Principle IV (Risk-taking):

A. Role-playing

1. Lecturette on Role-playing. (3 minutes)
2. Groups of 5-6: Choose one to play Instructor (facilitator or leader); others react to him on the spot. (5-8 minutes) (Participants respond to whatever they are feeling at the time.)
3. Talk about experiences (how it felt to be instructor) (5 minutes) (and how it felt to respond to him on the spot.)
4. Large group: Instructor in the center; give feedback on "me." (They have already role-played this.) (8 minutes)
5. Instructor's feelings about feedback. (2 minutes)
6. Small groups--express real feelings: why they did or did not follow through, what was the difference between role-playing and the actual. (10 minutes)
7. Self: write down feelings, insights, reactions, etc. (5 minutes)
8. Later in evening: write down "second thoughts" about feelings, reactions, etc.

B. Twenty Things I Love to Do (by Dr. Sidney Simon)

1. Ask your students (you do it along with them) to number from 1 to 20 on a piece of paper. Then, suggest that they list, as quickly as they can, 20 things in life which they really love to do. (Stress that the papers will not be collected, and that there is no right answer about what people should like.) Students will get unusually quiet, and at first, they

may even be baffled by such a non-academic task. Flow with it. And give them enough time to list what they REALLY love to do. (5-6 minutes)

2. When everyone has listed his 20 items, indicate that they are going to code the items as part of the process of value-clarification. Here are some suggested codes you might recommend. (5-6 minutes)
   a. Place the $ sign by any item which costs more than $3.
   b. Put an R in front of any item which involves some RISK. The risk might be physical, intellectual or emotional.
   c. Using the code letters F and M, indicate the items on your list you think your father and mother might have had on their lists if they had been asked to do this same thing at YOUR age.
   d. Place either the letter P or the letter A before each item. The P is to be used for items which you prefer doing with PEOPLE, and the A for items you prefer doing ALONE. (Stress again that there is no right answer. It is important just to become aware of your preferences.)
   e. Place a number 5 in front of any item which you think would not be on your list 5 years from now.
   f. Finally go down through your list and place near each item the date when you did it last.
3. After in small groups discuss: (25 minutes)
   a. respond in any way to the experience you've just had.
   b. did you really put down those items which you really like to do?

4. Instructor keeps lists for the next day (NO NAMES—person can recognize his own).
5. Instructor summary as to (a) what he saw happening; (b) amount of openness and pushing and honesty he saw operating.

Principle VII (Commitment/Actualization):

1. In small groups students discuss new insights and/or behaviors which may have occurred from the previous 9 days' experiences. (5-6 minutes)
2. Form a dyad with one person you have become able to talk to openly and comfortably. Each person establishes, with the help of his partner, two commitments: (a) personal dental care behavior(s) he will adhere to for the following 10 weeks, and (b) dental care behavior(s) and information he will work towards transferring to others (e.g., students, family). These are written down—person and partner have a copy of his commitments and a copy of partner's commitments. ("I will ..." statements) (15 minutes)
3. Arrangements for dyadic partner support in carrying out commitments is established. (6-7 minutes)
4. In the total group, evaluation by the students of the last 10 days; focus on what they see the potential effectiveness of the experiences being for themselves in terms of (a) personal growth and (b) dental health care. (10 minutes)

Affective I (8th Hour)

1. Instructor announces that this class is non-evaluative. Instructor indicates that in many classes the students know individuals but never get close to any one. This class will stress your feelings and reactions to each other and the instructor.
2. Form groups of four (4) individuals that you feel comfortable with; pick a leader. State first impressions to one another; next how you feel now toward each individual. First impressions of the instructor and how you feel about him now.
3. Disseminate risk-taking handout, (supra p. 27) top half; discussion, then bottom half. Agree or disagree.
4. Large group discussion regarding first impressions and risk-taking.

Affective II (9th Hour)

1. Groups of four (4) students; select new leader; leader plays the role of a dental health instructor (college or elementary level). The other members of the group will: (1) question the instructor about any aspect of the program and (2) tell the leader how you feel about the program. The role-playing leader reacts on-the-spot to the questions and feelings.
2. Handout a 3 x 5 card to each person. On side 1 the students will write their actual dental health behaviors and share these behaviors with each member of the group. Then on side 2, write YOUR IDEAL dental health behavior in terms of flossing, brushing, and disclosement (not the instructor's).
3. Have students identify personal characteristics that inhibit bringing the actual and the ideal behaviors together.

4. Large Group - Instructor encounters the students regarding the problems or personal characteristics that have been identified. Instructor states feelings about problems; asks if there is anything else that he can do to help them attain their values regarding dental health behavior. Students are encouraged through instructional encountering to seek alternatives to inhibitors.
5. Transparency and group contingency checked at the end of class. (80%: reinforcers given.)

Affective III (10th Hour)

1. Large group - Ask students to take a risk. Select an individual that you feel close to and would like to keep in touch with after this quarter.
2. After students form pairs, on 3 x 5 cards the students are asked to make a personal commitment (I will... statements) to their partner concerning the dental health behaviors they will adhere to for the next 10-12 weeks. Each student has a 3 x 5 card with his and his partner's commitment.
3. A low risk would be merely writing the actual behaviors and a high risk would be stating the ideal behaviors. A comfortable balance is encouraged by the instructor.
4. Instructor provides ten postcards addressed to the student's partner so that they may communicate during the next 10-12 weeks. The instructor hopes that each will discuss their personal commitments when they write to each other. Also, three (3) minutes will be given to the students to reunite with partners at the end of future class periods to check how they are doing with their personal commitments.

DENTAL SKILLS LAB MANUAL

Health Science 350
School Health Practices
Darwin Dennison, Ed.D.

TABLE OF CONTENTS*

*The research upon which this publication is based was performed pursuant to Contract No. NIH 72-4295 with the Department of Health, Education and Welfare, Public Health Service, National Institutes of Health, Bureau of Health Manpower Education, Division of Dental Health.

Introduction:

The purpose of this four (4) hour laboratory experience is to acquaint you with a dental disease control program. The program is designed to reduce the frequency of dental caries (cavities) and periodontal (gum) disease. The program is based upon the daily removal of plaque, a residue on the surface of the teeth which causes dental disease. Reduced or eliminated plaque is an index of positive dental health care and a major objective of this program. The laboratory work includes a lab on disclosing, recording, brushing, and flossing, with corresponding group experiences. These dental health skills, which require manual dexterity and practice, must be elicited for successful completion of the lab.

Materials:

Lab station materials include the following:

1. disclosing solution (Trace)
2. disposable bibs
3. dental floss (unwaxed)
4. paper cups
5. soap
6. paper towels

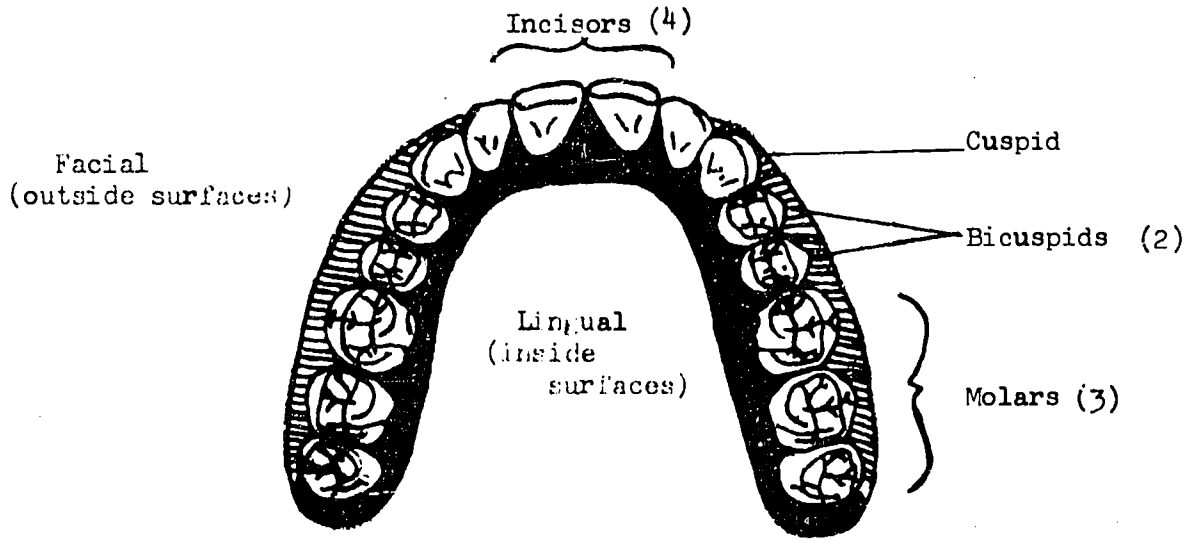
Each individual will be provided with the following materials to be used in the lab:

1. dental reflector
2. Floxite mirror and lamp
3. Mynol plain applicators
4. Oral B 30 toothbrush
5. Red pencil

General Information:

1. Before each lab period, wash hands and tie bib on.
2. Bring this Manual to each lab and class.
3. Each day hand in one (1) completed M-PCR. (p. 8)
4. At the end of each lab period place individual lab materials back in your materials box.
5. Place the materials box and the Floxite flashlight in the assigned storage space.
6. Wash dental reflector (beginning or end of lab).
7. Spaces on Lab Outline procedure are provided to check off steps completed.

Anatomy of the Mouth:



LAB I OUTLINE

A. Objectives

As a result of this lab experience you will be able to:

1. identify plaque in your own mouth.
2. observe all tooth surfaces with mirror and reflector.
3. demonstrate your ability to record plaque on the M-PCR.

B. Materials

Disclosing solution (Trace); dental reflector; Floxite Mirror and lamp; Mynol plain applicator; Oral B 30 toothbrush; red pencil.

C. Procedures

_____ 1. Introduction

_____ 2. Instructor demonstration of disclosing and recording. (pp. 7-8)

_____ 3. Students disclose and record self on the M-PCR.

_____ 4. Instructor observation, Objectives 1 and 2.

_____ 5. Instructor observation (Exam Station), Objective 3.

_____ 6. Students brush away stained areas.

_____ 7. Students hand in M-PCR.

LAB II OUTLINE

A. Objectives

As a result of this lab experience you will be able to:

1. give reactions to Lab I.
2. demonstrate the Bass brushing technique. (dentiform and self)
3. reduce the amount of plaque. (3-4 surfaces)

B. Materials

Disclosing solution (Trace); dental reflector; Floxite mirror and lamp; Mynol plain applicator; Oral B 30 toothbrush; dental floss (unwaxed); red pencil.

C. Procedures

_____ 1. Small discussion groups.

_____ 2. Instructor facilitation, Objective 1.

_____ 3. Students disclose and record self with M-PCR.

_____ 4. Instructor demonstration of brushing technique. (p. 9) (Student participation)

_____ 5. Students demonstrate Bass brushing technique.

_____ 6. Instructor observation, Objective 2.

_____ 7. Students re-disclose.

_____ 8. Instructor observation (Exam Station), Objective 3.

_____ 9. Students hand in M-PCR.

LAB III OUTLINE

A. Objectives

As a result of this lab experience you will be able to:

1. compare Lab I reactions with Lab II reactions.
2. examine and record the M-PCR on a partner.
3. demonstrate the flossing technique.
4. reduce the amount of plaque. (1-2 surfaces)

B. Materials

Disclosing solution (Trace); dental reflector; Floxite mirror and lamp; Mynol plain applicator; Oral B 30 toothbrush; dental floss (unwaxed); red pencil.

C. Procedures

_____ 1. Small discussion groups.

_____ 2. Instructor facilitation, Objective 1.

_____ 3. Students disclose and record partner.

_____ 4. Instructor observation, Objective 2.

_____ 5. Instructor demonstration of flossing. (p. 10)
(Student participation)

_____ 6. Students floss.

_____ 7. Instructor observation, Objective 3.

_____ 8. Students brush.

_____ 9. Students re-disclose.

_____ 10. Instructor observation (Exam Station), Objective 4.

_____ 11. Students hand in M-PCR.

LAB IV OUTLINE

A. Objectives

As a result of this lab experience you will be able to:

1. share your reactions about dental health behaviors regarding yourself and others.
2. brush and floss within a 15-minute period.
3. reduce your plaque level to zero.

B. Materials

Disclosing solution (Trace); dental reflector; Floxite mirror and lamp; Mynol plain applicator; Oral B 30 toothbrush; dental floss (unwaxed); red pencil.

C. Procedures

_____ 1. Students floss.

_____ 2. Students brush.

_____ 3. Instructor observation, Objective 2.

_____ 4. Students disclose and record.

_____ 5. Students re-brush, re-floss, and re-disclose (if necessary).

_____ 6. Instructor observation (Exam Station), Objective 3.

_____ 7. Students hand in M-PCR.

_____ 8. Small group and total class discussion.

_____ 9. Instructor facilitation, Objective 1.

Disclosing Procedure:

1. Tilt head back, open mouth, and withdraw tongue.
2. Have a partner place six (6) drops of disclosing solution under your tongue. (NOTE: This solution will stain lips and hands for approximately four (4) hours; if you do not desire stain on your lips, use Chapstick.* The stain washes from clothing with cold water.)
3. Allow solution to remain in the mouth for fifteen (15) seconds or until saliva accummulates.
4. Forceably swish the solution around the mouth and rub the tongue over all tooth surfaces.
5. Swallow the remaining solution or expel into the sink.
6. Do not rinse mouth until the recording is completed.

*See instructor.

Recording and Observing

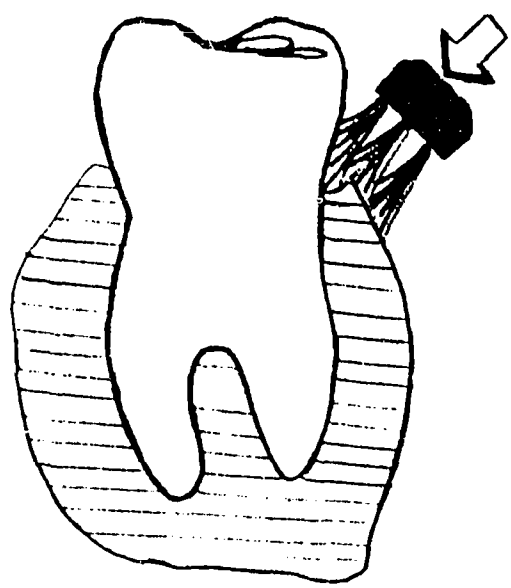
(Modified Plaque Control Record, M-PCR)**

1. Observe all tooth surfaces with mirror and reflector.
2. Cross off missing teeth.
3. Note dark pink (stained) areas on tooth surfaces—this indicates plaque.
4. Shade these corresponding tooth surfaces with red pencil on the M-PCR.
5. Count the number of shaded areas and record.
6. After lab instruction, circle stained tooth surfaces that were not removed.
7. Record the number of circled, stained tooth surfaces.

**These forms are provided at the back of the manual—use one (1) per lab.

Bass Method of Brushing:

1. Do not use this method of brushing with a hard bristle brush.
2. For the outside surfaces of all teeth and the inside surfaces of the back teeth hold the brush horizontally with the bristles at the junction between the teeth and gums.
3. The brush should be on a 45° angle toward the gum line. (Observe this procedure in Floxite mirror.)



4. Brush no more than two teeth at one placement. (7-8 placements/jaw; 8-10 strokes/placement)
5. Brush gently with a short "back and forth" vibratory motion--hold the brush with tips of fingers.
6. For the inside surfaces of the upper and lower front teeth, hold the brush vertically and make several gentle "back and forth" strokes over the gum tissue and teeth.
7. Brush "back and forth" on biting surfaces.
8. Rinse with water.

Flossing Procedure:

1. Cut off a piece of floss approximately three (3) feet long.
2. Wrap the floss lightly around the middle fingers at the lower joint.
3. Use thumbs for upper teeth and forefingers for lower teeth. (Thumb and forefinger for front interproximal areas.)
4. The area of floss to be used should be approximately 1/2 inch and not more than 3/4 inch.
5. Start with distal areas at the end of each arch.
6. Gently slide the floss between the teeth with a sawing motion. (Caution: Do not "pop" the floss from the contact point into the open space.)
7. Contour the floss around each tooth and move the floss up and down on each tooth until it is "squeaky" clean. (Notice the floss disappearing under the gingival margin.)
8. Move to clean sections of floss by turning from one middle finger to the other.
9. Rinse mouth with water.

Evaluation:

Laboratory evaluation is based upon the successful completion of the stated lab objectives. Completing many of these objectives requires manual dexterity and they must be completed within a specific period of time; therefore, it will be to your advantage to practice these skills at home. The last objective in each lab will be quantitatively evaluated. The instructor checks off each completed objective on your M-PCR. A verified reduction of plaque to the lab requirement qualifies you to receive dental health materials for home use. You will have at least two (2) opportunities to complete each objective. Individual extra-help lab may be scheduled if requested.

MODIFIED PLAQUE CONTROL RECORD (M-PCR)

OBJECTIVES

___ 1

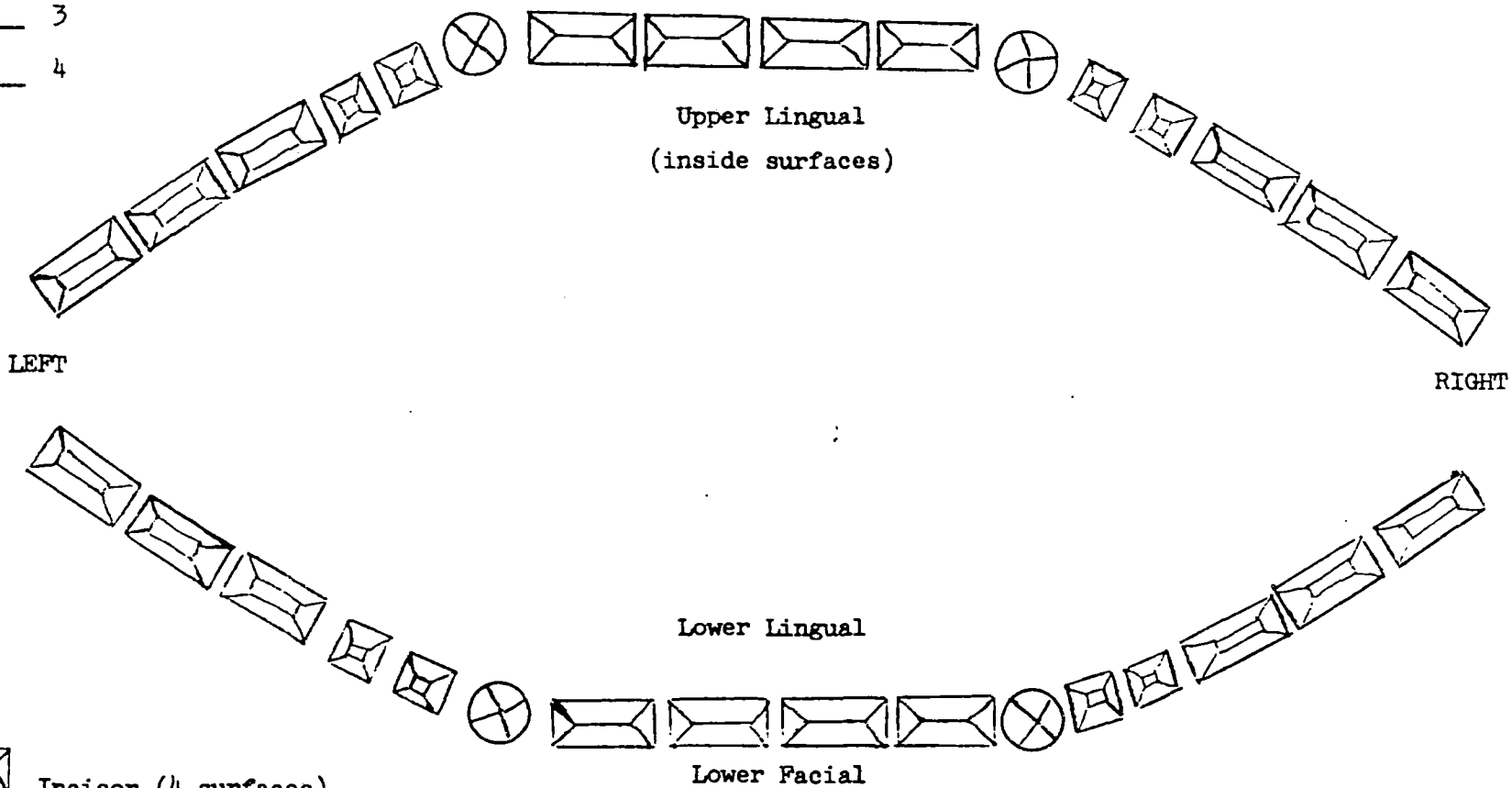
___ 2

___ 3

___ 4

Name _____

Date _____ Lab No. _____



KEY:

Incisor (4 surfaces)

Cuspid (4 surfaces)

Bicuspid (5 surfaces)

Molar (5 surfaces)

Total number of
shaded tooth surfaces _____

Draw a circle around stained surfaces
not removed as a result of lab activity.

Total number of remaining
shaded tooth surfaces (Circled) _____

SELF-REPORT

Dental Behavior Inventory

Health Science 350
School Health Practices
Darwin Dennison, Ed.D.

Dental Disease Control Program:*

A dental disease control program identifies various dental behaviors that, if elicited, reduce the incidence of periodontal disease and dental caries. The basic components of this control program include brushing, flossing, and disclosing. To be effective, the program necessitates the complete removal of plaque every 24 hours. While you are learning plaque removal skills, you will have to brush, floss, and disclose more often than after these behaviors have been established. Disclosing frequency should be based upon your ability to remove plaque. For approximately two (2) weeks after lab instruction, disclosement is recommended twice per week. After you have established brushing and flossing proficiency, you would disclose weekly. However, if you observe stained areas, you would disclose and check more frequently.

Purpose of the Inventory:

The purpose of this inventory is to record dental health behaviors that are included in the control program. The tear-outs (p. 3) are to be completed anonymously and will be collected by the instructor periodically. This gives the instructor feed-back regarding your dental health. The inventory is not used for student evaluation.

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Directions for Completing the Inventory:

Record the following behaviors on the tear-out sheet for the previous day:

Brushing - whether or not you brushed your teeth using the Bass method.

Flossing - whether or not you flossed your teeth (class method).

Disclosing & Inspecting - whether or not you used the disclosing solution and inspected your teeth during the previous four (4) days.

Example:

Let us assume that on December 1 an individual brushed and flossed his teeth, but did not disclose within the previous four days.

The tear-out sheet (reported on December 2) would be completed as follows:

DATE OF OBSERVATION 12-1
(previous day)

	YES	NO
Brushed (Bass Method)	X	
Flossed (Class Method)	X	
Disclosed (during last 4 days)		X
Date of Last Disclosement	11-23	

DATE OF OBSERVATION _____
(previous day)

	YES	NO
BRUSHED (Bass Method)	▱	▱
FLOSSED (Class Method)	▱	▱
DISCLOSED (during last 4 days)	▱	▱

DATE OF LAST DISCLOSEMENT _____

DATE OF OBSERVATION _____
(previous day)

	YES	NO
BRUSHED (Bass Method)	▱	▱
FLOSSED (Class Method)	▱	▱
DISCLOSED (during last 4 days)	▱	▱

DATE OF LAST DISCLOSEMENT _____

OPTIONAL POINT AND CHART SYSTEM

The purpose of the point and chart system is to enable you to record and observe your dental behavior over a period of time. If a habit is formed, the chart will reflect its presence by leveling out.

Directions:

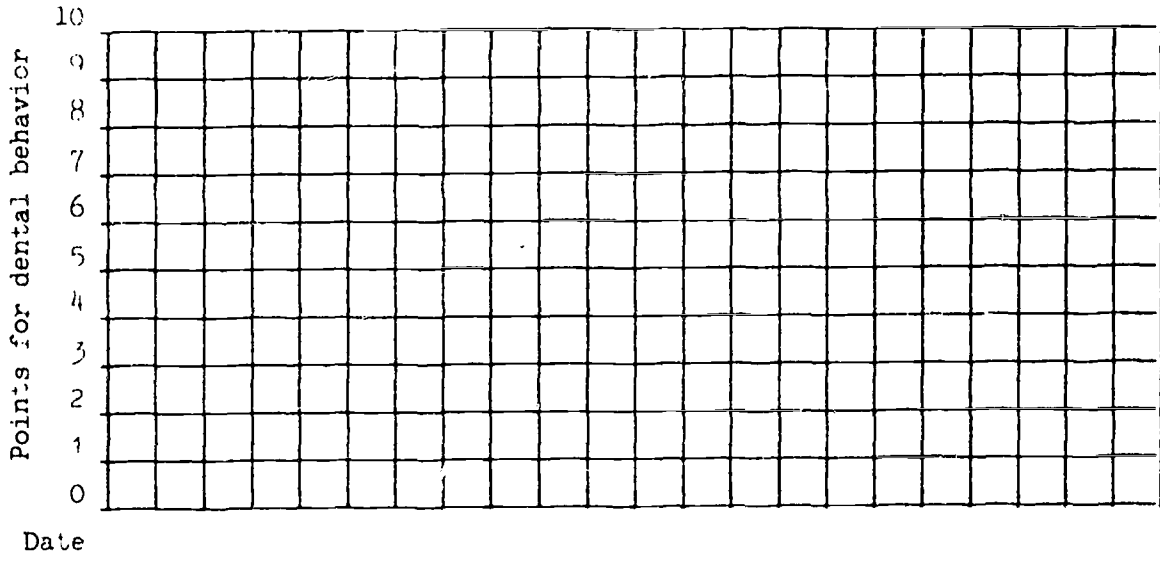
According to the Self-Report Dental Behavior Inventory:

if you used the Bass Method of Brushing: 3 points

if you flossed using the class method: 4 points

if you disclosed during the last 4 days: 3 points

10 points TOTAL



Health Science 350
School Health Practices
Form A
D. Dennison, Ed.D.

Name _____

Time _____ Date _____

_____ 1. The process of disorganizing bacterial colonies by brushing and flossing takes an average individual approximately

1) 2½ minutes/day
2) 5 minutes/day
3) 10-15 minutes/day
4) 20-30 minutes/day

_____ 2. Plaque is

1) destructive calcium on the teeth
2) a substance that discolors the teeth
3) an advanced form of tartar
4) colorless bacterial colonies on the teeth and gums

_____ 3. The products of bacterial action include

1) acids, toxins, and dextrans
2) acids, toxins, and sucrose
3) acids and toxins only

_____ 4. Decay of the teeth is associated with which of the following conditions?

1) a deficiency of calcium in the saliva
2) bacterial enzymes that digest proteins
3) the production of acids by bacterial plaque
4) the erosive action of toxins on the teeth

_____ 5. An important causative factor in periodontal disease is

1) a change in saliva that causes tartar to form on the teeth
2) an inherited weakness of the gums and supporting bone
3) an accumulation of toxins under the gum line
4) a lack of Vitamin A in the diet

_____ 6. Flossing is essential for good dental health because it

1) contains floxite which destroys plaque
2) strengthens the integrity of the gingival margin
3) removes the plaque under the papilla
4) makes the teeth more resistant to the destructive action of acids

_____ 7. Most of the teeth lost between the ages of 12 to 20 is due to

1) dental caries
2) malocclusion
3) periodontal disease
4) halitosis

_____ 8. Fluoridated drinking water will

1) eliminate the unpleasant odor of chlorine
2) help prevent dental caries
3) aid in digestion of food
4) purify the water and make it safe to drink
5) eliminate the cloudiness

____ 9. After effective dental behavioral skills have been learned an individual should disclose

1) every day
2) weekly
3) every two weeks
4) monthly

____ 10. To control dental diseases, bacterial plaque should be removed once every

1) 12 hours
2) 24 hours
3) 48 hours
4) 72 hours

____ 11. The common factor causally related to dental caries and periodontal disease is

1) toxins
2) plaque
3) dextrans
4) acids

____ 12. Identify the toothbrush characteristic that is <u>not</u> associated with the Bass Method of Brushing.

1) tips are rounded and polished
2) uneven across the top of the bristles
3) more bristles per brush head
4) soft bristles

____ 13. The area of floss between the fingers should be approximately

1) $\frac{1}{2}$ inch
2) 1 inch
3) $1\frac{1}{2}$ inch

____ 14. Common halitosis can be prevented by

1) removing bacterial plaque every 24 hours
2) most over-the-counter mouthwashes
3) using a flavored toothpaste
4) chewing gum or breath mints

____ 15. When using the Bass Method of Brushing, the toothbrush should be held at a

1) 30° angle into the gingival margin
2) 45° angle into the gingival margin
3) 60° angle into the gingival margin
4) 90° angle into the gingival margin

____ 16. Community fluoridation is considered to be an ideal public health measure because

1) no cooperative effort on the part of the individual is required
2) it is safe, effective, and economical
3) adults and children benefit
4) all of the above

____ 17. After the age of 25-30, the most significant cause of tooth loss is due to

1) dental caries
2) malocclusion
3) periodontal disease
4) halitosis

____ 18. An Oral B 30 toothbrush is <u>ineffective</u> in

1) cleaning the inner (lingual) surfaces of the teeth
2) cleaning under the papilla
3) cleaning the frontal gingival margin
4) none of the above

____ 19. The second stage of periodontal disease is referred to as

1) gingivitis
2) periodontitis
3) bone loss stage
4) pyorrhea

____ 20. There is a direct relationship between the incidence of tooth decay and

1) a vitamin deficiency
2) ingestion of sugar products
3) a protein deficiency
4) ingestion of fatty foods

____ 21. The best reason to avoid between meal impacting snacks (particularly sticky snacks) is

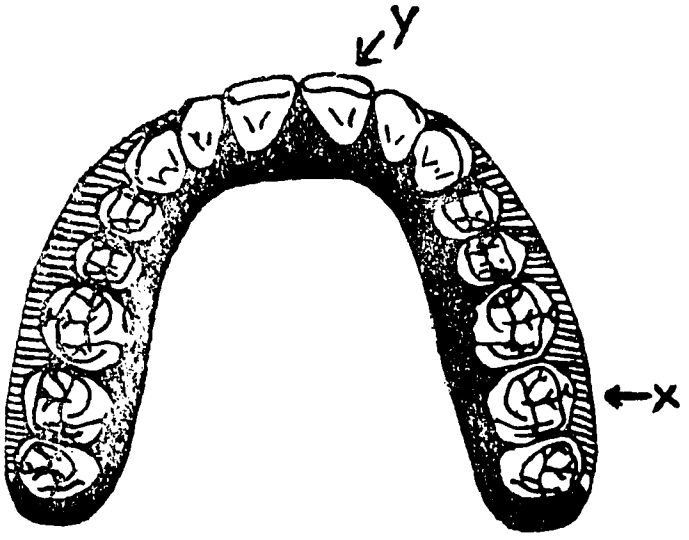
1) snacks reduce the appetite for a well-balanced meal
2) bacteria grows rapidly and forms more plaque
3) snacks are devoid of nutritional value
4) snacks are generally not fibrous foods

____ 22. The most effective fluoridation method is

1) topical
2) systemic
3) tablets
4) none of the above

____ 23. Two ways in which topical fluorides can be administered are

1) fluoride tablets, use of fluoridated toothpaste
2) dental application of fluoride prophylaxis paste, use of fluoridated toothpaste
3) fluoridation of community water supplies, school fluoridation
4) none of the above



For questions 24 and 25 refer to the diagram above.

_____ 24. The tooth with an "X" in front of it is a

1) cuspid
2) molar
3) bicuspid
4) incisor

_____ 25. The tooth with a "Y" in front of it is a

1) cuspid
2) molar
3) bicuspid
4) incisor

Health Science 350
School Health Practices
Form B
D. Dennison, Ed.D.

Name _____

Date _____ Time _____

_____ 1. A major purpose of establishing good dental health practices after age 20 is

1) to reduce the incidence of periodontal disease
2) to reduce the incidence of dental caries
3) because of the increase of sugar in the diet in recent years
4) all of the above

_____ 2. Topical fluoride treatment is administered by

1) drinking fluoridated water
2) chewing fluoride tablets
3) home fluoridation
4) brushing with a fluoride toothpaste

_____ 3. Acid has the effect of

1) breaking down connective tissue in the gums
2) attracting food debris
3) breaking down the enamel on the teeth
4) none of the above

_____ 4. Gingivitis is a progressive disease of the

1) mouth
2) teeth
3) gums
4) throat
5) tongue

_____ 5. Which snack is plaque producing?

1) diet soda and potato chips
2) iced tea and pretzels
3) milk and cookies
4) beer and popcorn

_____ 6. Malocclusion

1) is decay in the crown of a tooth
2) is failure of teeth to grow through gums
3) is a disease caused by not brushing the teeth
4) is the improper alignment of the teeth

_____ 7. A classmate of Joan's told her that going to a dentist only to learn that your teeth are in good condition is a waste of money. The best time to visit a dentist is

1) when you think you need dental treatment
2) when you know you need dental treatment
3) at regular periodical intervals
4) at the first sign of a toothache
5) when you can't stop a toothache

____ 8. The substance common to these snacks: gum, ice cream, and candy is

1) protein
2) starch
3) vitamins
4) carbohydrates

____ 9. The common factor causally related to dental caries and periodontal disease is

1) malocclusion
2) plaque
3) saliva
4) inherited weaknesses

____ 10. According to the S-R DBI, when a student is first learning plaque removal skills, he should disclose

1) every day
2) twice per week
3) weekly
4) when necessary

____ 11. The fluoridation technique most effective on uneruptive teeth is

1) the use of toothpaste containing fluoride
2) the administration of fluoride prophylaxis administered by a dentist or a dental hygienist
3) home fluoridation
4) none of the above

____ 12. The most common dental disease in children is

1) gingivitis
2) malocclusion
3) dental caries
4) abscesses

____ 13. Stannous fluoride is

1) a systemic fluoride treatment
2) the same as sodium fluoride
3) a topical fluoride treatment
4) none of the above

_____ 14. The production of acids by bacterial plaque is associated with which of the following conditions?

1) decay of the teeth
2) halitosis (bad breath)
3) malformation of the teeth
4) bleeding and swollen gums

_____ 15. An effective dental disease control program includes the removal of plaque

1) once a day
2) twice a day
3) three times a day
4) once a week

_____ 16. Which characteristic does a recommended toothbrush have?

1) firm bristles
2) uneven across the top of the bristles
3) soft bristles
4) not polished or rounded bristles

_____ 17. Which statement is false about flossing?

1) the floss goes under the gingival margin
2) contains floxite which destroys plaque
3) removes the plaque under the papilla
4) helps prevent periodontal disease

_____ 18. The first stage of periodontal disease is

1) gingivitis
2) periodontitis
3) bone loss stage
4) pyorrhea

_____ 19. Before the age of 30, the most significant cause of tooth loss is due to

1) dental caries
2) malocclusion
3) gingivitis
4) periodontitis

_____ 20. How many minutes after eating sugar products does the most bacterial action occur?

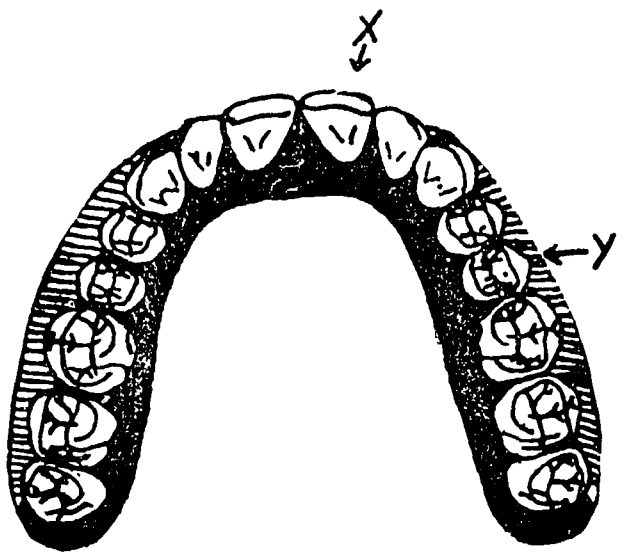
1) 0 - 20
2) 20 - 40
3) 40 - 60
4) 60 - 90

_____ 21. The inclusion of sugar in the diet

1) gives people more energy
2) makes food taste better
3) nutritionally balances a meal
4) reduces the number of calories taken in daily

_____ 22. Fluorides are put in the drinking water

1) to kill germs
2) to cure tooth decay
3) to help older people keep their teeth
4) to prevent tooth decay



For questions 23 and 24 refer to the diagram above.

_____ 23. The tooth with an "X" in front of it is a

1) cuspid
2) molar
3) bicuspid
4) incisor

_____ 24. The tooth with a "Y" in front of it is a

1) cuspid
2) molar
3) bicuspid
4) incisor

DESCRIPTION OF SLIDES

I. Disclosing and Observing (Ball State University)
   1. Materials (Trace, reflector, Floxite flashlight)
   2. Position (Head back, tongue withdrawn)
   3. Trace placed
   4. Swish solution
   5. Rub tongue
   6. Observe front
   7. Observe inside
   8. Observe inside
   9. Observe outside

II. Brushing (Ball State University)
   1. Upper position
   2. Lower position
   3. Chewing surfaces
   4. Inside Incisors Upper
   5. Inside Incisors Lower

III. Flossing (Ball State University)
   1. Arm length
   2. Wrapping
   3. Basic position
   4. Upper incisors and cuspids position
   5. Upper bicuspids and molars position
   6. Lower jaw position
   7. Insert to contact point
   8. Contouring
   9. Up-down motion
   10. Under gingival margin

IV. Comparison of Hygienic Techniques (Indiana State Board of Health)
   1. Mouth before using wafer mistakingly appears clean
   2. Same mouth after using wafer (shows harmful deposits) traditional method
   3. Brushing away deposits

4. Clean mouth after brushing
5. Clean mouth after using second wafer (no deposits)
6. Plaque formation - one day without brushing (using wafer)
7. Plaque formation - two days without brushing
8. Plaque formation - three days without brushing
9. Plaque formation - five days without brushing
10. Comparison of hygienic techniques (traditional vs. Bass method)

V. Effects of Detergent Foods, Dental Irrigators, etc. (Merwyn Landay, D.D.S., Temple University School of Dentistry)
1. Clean mouth
2. Three weeks - no brushing
3. 15 minute mouth wash rinse
4. 1/2 hour chewing carrots
5. 15 minute water-pik (All done consecutively on same person)

VI. Carious Teeth and Gingivitis
1. Dental Caries Statistics
2. Permanent - Excellent
3. Deciduous - Excellent
4. Rampant Caries
5. Healthy mouth
6. Gingivitis

VII. Periodontal Disease (Henry Swenson, D.D.S., Indiana University Dental School)
1. Periodontal probe prior to insertion into pocket
2. Periodontal probe inserted 6 mm
3. Extracted tooth; only 4 mm of root end not stained

VIII. Periodontal Disease (American Dental Association)
1. Periodontal Statistics
2. Drawing - Cross section normal tooth and supporting structures
3. Kodaslide. Clinical normal gingival tissue
4. Radiograph. Normal bone
5. Drawing - Marginal gingivitis
6. Kodaslide. Clinical marginal gingivitis

7. Drawing - Incipient bone loss (periodontitis)
8. Kodaslide. Clinical marginal periodontitis
9. Radiograph. Incipient bone loss (periodontitis)
10. Drawing - Moderate bone loss (periodontitis)
11. Kodaslide. Clinical moderate periodontitis
12. Radiograph. Moderate bone loss (periodontitis)
13. Drawing - Advanced bone loss (periodontitis)
14. Kodaslide. Clinical advanced bone loss (periodontitis)
15. Radiograph. Advanced bone loss (periodontitis)

IX. Instruction for Calculus Kit (Indiana Dental Health Task Force)
1. Tooth in round base - Subgingival calculus (light color)
2. Tooth in square base - Supragingival calculus (dark color)
3. Tooth mounted on card - calculus free

DISEASES OF THE TEETH, GUMS, AND MOUTH

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Plaque is a soft, tenacious, colorless adherent bacterial deposit which forms on the surface of teeth. It is the pathogenic factor that causes dental caries and periodontal disease, which is a disease that destroys the tissues surrounding the teeth, the gingiva, the bone, and the periodontal fibers. The bacteria in plaque yields products of bacterial action including acids, toxins, and dextrans. The acids cause tooth decay by decomposing the enamel of the teeth. The toxins, or poisons, help to cause periodontal disease by weakening and eventually destroying the periodontal fibers which hold the teeth in place. The dextrans, which are gooey, sticky substances, hold the bacteria, acids and toxins next to the teeth and gingiva creating a "mushrooming effect." Calculus (tartar) is formed when plaque is not removed every 24 hours. These hard deposits must be removed by dental instruments. If the calculus is not removed, it will irritate the gingiva and increase the disease process.

Dental caries begins with a small hole, usually in a fissure or a flaw of a tooth, in an area where food may become lodged, or where it is difficult to remove food. Unless small cavities are filled, the decay will penetrate the dentin. Decay progresses rapidly in dentin because it is softer than enamel. When decay reaches the pulp, the blood vessels and nerves become infected and an abscess will probably form. There is usually soreness, pulsating pain, and swelling with the abscess.[1]

Dental caries is the most common physical defect found in school aged children and youth.[2] Ninety-six per cent of high school pupils have dental decay. Among adults, aged 20 to 35, there are from 13-20 teeth per person which have been affected by dental decay.[3]

Gingivitis is the first stage of periodontal disease. The gingiva becomes inflamed, red, puffy, and may bleed easily. Gingivitis is a progressive disease. It starts in early childhood and can be reversed at this stage; i.e., gum tissue will revert to normal.[4,5] If gingival infection is not reversed, the inflammation spreads and the gum withdraws from the tooth forming a pocket which fills with bacteria and pus. This, the second stage of periodontal disease, is called periodontitis. Structures surrounding and supporting the teeth weaken and eventually loss of teeth may occur. Periodontitis is a slow, creeping, virtually painless infection in the developing stages; a disfiguring disease when advanced.[6,7]

Sixty per cent of young adults have periodontal disease; so do 80% of the middle-aged and 90% of those over 65. And though it is usually considered an adult disease, an astounding number of adolescents suffer from periodontal disease in its more destructive stages.[8] Advanced periodontal disease is evidenced by the fact that seventy per cent of persons over 65 years of age are edentulous (without natural teeth). Thorough daily brushing and flossing significantly reduces dental caries and periodontal disease.

Halitosis, or bad breath, is also caused by a lack of proper oral hygiene and the accumulation of plaque. Other causes of halitosis are infected teeth or gums, periodontal disease, and stomach disorders. Common halitosis can be prevented by removing bacterial plaque every 24 hours.[9] This necessitates daily brushing and flossing.

Other diseases of the teeth, gums, and mouth that are not necessarily precipitated by plaque and inadequate oral hygiene include malocclusion, Vincent's Disease, cancer of the mouth, and oral ulcerations. These diseases are described and defined in the ensuing paragraphs.

Malocclusion. This term applies to irregularities in the position of the teeth and the improper coming together of the teeth upon closing the jaw. There are two general causes of malocclusion. One is heredity, such as tooth size and jaw structure. The other cause is due to habits such as thumb and finger sucking, chewing on foreign objects, lip biting, early loss of primary or permanent teeth as a result of poor dental care.[10]

Vincent's Disease. This disease attacks the gums and tissues of the mouth and throat; it causes swollen, easy to bleed tissues that are tender and painful. It also causes bad breath. Some of the predisposing factors include improper diet, lack of sleep, lack of oral hygiene, physical malaise, and undue stress.

Cancer of the Mouth. Mouth cancer should be suspected if one observes any unusual conditions in the mouth, lips, or tongue. The most common symptom is a sore that fails to heal and bleeds rather easily—it may or may not be painful. Other signs may be a lump or thickening, whitish patch, sore throat, bleeding, difficulty or pain in chewing or swallowing food, or the sensation of something in the throat.[11]

Oral Ulcerations (including fever blisters, canker sores, and abscess). Fever blisters, a blister-like sore, usually occurs on the lip or at the corner of the mouth. It is characterized by swelling or tightness. Fever blisters are viral, rather common, and usually do not require professional treatment.[12] Canker sores are single or multiple round ulcerations on the lips, cheeks, tongue, palate, gums or floor of the mouth. They begin as a bright red area. The center skin dies and becomes grayish white. The cause is unknown, and they usually disappear in ten to fourteen days. Canker sores are rather common and professional treatment is not usually indicated.[13]

An abscess is a pus-draining sore usually associated with non-vital (dead) teeth, or teeth with severe periodontal disease. The sore is infectious and can be harmful even though it does not hurt. Swelling occurs initially; and if treatment is not received in time, the abscess will drain, the swelling will decrease and septicemia will result.

Dental Diseases Self Test

_____ 1. The most common physical defect found in school age children and youth is

a) gingivitis
b) malocclusion
c) halitosis
d) dental caries

_____ 2. Of the following, which is a genetic condition?

a) periodontal disease
b) Vincent's Disease
c) malocclusion
d) halitosis

_____ 3. Predisposing factors, including improper diet, lack of sleep, lack of oral hygiene, and physical malaise, may lead to

a) Vincent's Disease
b) dental caries
c) halitosis
d) gingivitis

_____ 4. The first stage of periodontal disease is

a) gingivitis
b) halitosis
c) oral ulcerations
d) malocclusion

_____ 5. Of the following which generally requires professional treatment?

a) canker sores
b) fever blisters
c) abscesses
d) halitosis

_____ 6. The primary cause of common halitosis is

a) lack of sleep
b) infected teeth or gums
c) stomach disorders
d) lack of proper oral hygiene

_____ 7. Of the following diseases, which disease is usually indicated by a lump or thickening, whitish patch, sore throat, bleeding, difficulty or pain in chewing or swallowing food, or the sensation of something in the throat?

a) cancer of the mouth
b) oral ulceration
c) gingivitis
d) Vincent's Disease

Answers: 1(d), 2(c), 3(a), 4(a), 5(c), 6(d), 7(a)

FOOTNOTES

[1]American Dental Association, "You Can Prevent Tooth Decay," 1969.

[2]National Institutes of Dental Research, "Research Explores Plaque, Combat Zone in Dental Disease," National Institutes of Health, Bethesda, Maryland.

[3]U. S. Department of Health, Education, and Welfare, "Dental Care of Children, Illness Among Children," Children's Bureau Publication No. 405, 1963, p. 36.

[4]U. S. Department of Health, Education, and Welfare, "Research Explores Pyorrhea and Other Gum Diseases," Periodontal Disease, Public Health Service, National Institutes of Health, 1970, pp. 4-5.

[5]National Institutes of Health, "Perio," Office of Information, Division of Dental Health, Bureau of Health Manpower Education, Bethesda, Maryland.

[6]"Research Explores Pyorrhea and Other Gum Diseases," p. 4.

[7]"Perio"

[8]"Research Explores Pyorrhea and Other Gum Diseases," p. 5.

[9]American Dental Association, "Dental Health Facts for Teachers," 1970.

[10]Park and Ashman, A Textbook for Dental Assistants, W. B. Saunders Company, Philadelphia, 1966, pp. 383-384.

[11]U. S. Department of Health, Education, and Welfare, "Cancer of the Mouth," Public Health Service, p. 2.

[12]U. S. Department of Health, Education, and Welfare, "Canker Sores and Other Oral Ulcerations," Public Health Service, pp. 1-4.

[13]"Canker Sores and Other Oral Ulcerations," pp. 5-8.

THE IMPORTANCE OF NUTRITION AND FLUORIDATION IN DENTAL HEALTH

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Nutritional Aspects. The national per capita average of sugar ingested daily is approximately 30 teaspoonsful. This results in 600 calories per day. In this situation, an individual who eats 2400 calories per day would have 25% of his caloric intake in sugar.[1] This is excessive when one considers that there is no need for sugar in our diet and the only effect is for taste and calories. In fact, there would be no ill effects on our health if all sugar was eliminated from our diets. This high usage of sugar has deleterious effects upon our health. It contributes to the high incidence of dental disease and body overweight. Also, foods high in sugar content reduce the appetite for nutritious foods if they are eaten between meals as a snack.

Research has indicated that there is a direct relationship between the ingestion of sugar products and the incidence of dental decay.[2] The most significant factor related to increased caries was the between-meal eating of foods high in sugar content. Popular snack foods (candy, soft drinks, gum, donuts, etc.) are high in sugar content. A popular candy bar has 12 teaspoonsful of sugar which generates 240 calories; a sweet carbonated soft drink, 4-1/3 teaspoonsful; a piece of apple pie, 10 teaspoonsful. These foods create intense bacterial activity for about 20 minutes after eating. This activity produces acids which literally bathe the teeth in a substance which can break down the enamel of the teeth causing decay. The destructive action continues even after the sugar products are swallowed. Generally, individuals who frequently snack have significantly greater dental decay than those who confine their eating to three meals per day.

Other nutritional factors that contribute to the high incidence of dental disease include the use of white refined flour and soft impacting foods. Individuals using large quantities of white refined wheat flour in their diet were found to have considerably more tooth decay than those using moderate to small amounts.[3] Impacting foods are those that are soft and require little chewing. There is a tendency for these foods to become impacted between the teeth and gingiva, and in fissures and grooves on the teeth. White refined flour products and impacting foods tend to nourish bacteria on the teeth and gingiva. The products of this bacterial action increases the probability of dental caries and periodontal disease.

Nutritionally, there are certain basic safeguards an individual can take to lower the risk of dental disease. A few of these safeguards include: (1) reducing the intake of sugar products in the diet, (2) eliminating snack foods that are high in sugar content and have impacting qualities, and (3) replacing white refined flour products with whole wheat products or crackers whenever possible. Also, the use of lozenges, cough drops, hard candies, and lollipops should be discontinued. They are particularly harmful to the teeth because of the continuous bacterial action occuring in the mouth during their use. One individual who was a habitual user of candied cough drops "developed 21 cavities in a period of six months."[4]

If white refined flour products and/or impacting foods are consumed, it would be best to do so at a time when the teeth and mouth could be thoroughly cleaned afterwards. Sugar products and sweets should be eaten all at one time--preferably as a dessert--rather than eaten periodically throughout the day.

The following list includes snack foods that do <u>not</u> have high concentrations of sugar. Substitute and/or use these foods for between-meal snacks whenever possible.

Potato chips, corn chips
Raw vegetables: carrots & celery sticks, turnips
Fresh fruit: apples, grapes
Diet pop
Cold meat cuts
Orange juice, unsweetened fruit juices, whole milk
Sugarless gum
Whole wheat bread and crackers
Peanuts
Popcorn

Fluoridation Aspects. Another way to reduce dental decay is to support and invest in the community fluoridation of water. Children born and raised in areas that fluoridate their water supply have 60 to 65 per cent less cavities and lose fewer permanent teeth than children who live in non-fluoridated areas.[5] Community fluoridation saves approximately $70 per person on unneeded dental expenses at a cost of only $.13 per person per year.[6] Fluoridation is effective and safe—every major dental, medical, and school health organization supports it.

Basically, there are two (2) approaches to the administration of fluoride—systemic and topical. In the systemic method, an individual ingests the fluoride in community drinking water. The fluoride then enters the blood circulation and is incorporated into the enamel of the developing teeth. This makes the teeth harder and more resistant to decay. Community fluoridation is an ideal measure because it is not only effective and economical, but it requires no cooperative effort on the part of the individual.

Other systemic methods include home fluoridation, school fluoridation, and fluoride tablets. The amount of fluoride ingested by tablet form is adjusted by taking into account the natural fluoride present in the water supply. A prescription is required to obtain tablets. These methods are effective in reducing decay; however, they are more expensive to administer.

The topical method is utilized after the teeth have erupted. In this method, an individual's teeth are exposed to fluoride from the mouth. The fluoride when applied topically enters into the teeth through microscopic pores in the enamel. Clinical evidence has been gathered to indicate that a topical application of either sodium fluoride or stannous fluoride to clean tooth surfaces of children results in a 40 per cent reduction in dental caries.[7] Stannous fluoride and acidulated phosphate fluoride have an advantage over sodium fluoride in that it requires only one (1) application, whereas sodium fluoride requires four (4) applications. Self administered topical applications include mouth rinses, fluoride paste, etc. and can be conducted in an elementary classroom supervised by the classroom teacher.

Self administered topical applications of fluoride measures include fluoridated toothpastes used at home. Fluoridated prophylaxis pastes,

gels, and solutions are applied by dental hygienists to assist patients in preventing dental caries. Another example is when an adult drinks fluoridated community water. In this situation, the fluoride comes into contact with the teeth while the water is in the mouth. These topical fluorides, although not as effective as systemic application, benefit the teeth of children and adults.

FOOTNOTES

[1]"Interpreting Dietronics," Dietronics Division of Hanson Research Corporation, Northridge, California, p. 6.

[2]American Dental Association, "Diet and Dental Health," Chicago, 1967, p. 3.

[3]American Dental Association, "Diet and Dental Health," Chicago, 1967, p. 6.

[4]"Effects of Acids on Teeth," Consumer Bulletin, February, 1972, pp. 22-24.

[5]Indiana State Board of Health, "Fluoridation for your Community," Indianapolis, 1969, p. 2.

[6]"Better Teeth for Life...Fluoridation," U. S. Government Printing Office, Washington, D.C., 1968, Public Health Service Publication No. 636, p. 14.

[7]Galagan, D. J. and Knutson, J. W. "The effect of topically applied fluorides on dental caries experience," Pub. Health Rep., 62:1477, October 10, 1947.

NUTRITION AND FLUORIDATION SELF TEST

_____ 1. How many minutes after eating sugar products does the most bacterial action occur?

a) 0 - 20
b) 20 - 40
c) 40 - 60
d) 60 - 90

_____ 2. If all sugar was eliminated from a diet a person would

a) be anemic
b) not experience any physiological changes
c) be deficient of certain nutrients
d) would need to take multiple vitamins

_____ 3. The inclusion of sugar in the diet

a) gives people more energy
b) makes food taste better
c) nutritionally balances a meal
d) reduces the number of calories taken in daily

_____ 4. There is a relationship between the ingestion of sugar and

a) a vitamin deficient diet
b) incidence of tooth decay
c) need for protein

_____ 5. The two basic approaches to the administration of fluorides are

a) topical and diagnostic
b) diagnostic and systemic
c) topical and systemic
d) none of the above

_____ 6. The safest, most effective and economical method of fluoridation is

a) topical fluoridation
b) school fluoridation
c) fluoridation of community water
d) none of the above

_____ 7. Which fluoridation method is <u>not</u> a systemic administration?

a) the administration of fluoride prophylaxis paste
b) home fluoridation
c) consumption of fluoride tablets
d) none of the above

_____ 8. Considerable clinical evidence has been gathered to demonstrate that the topical application of fluorides can reduce the incidence of

a) periodontal disease
b) bacteria in water
c) dental caries
d) all of the above

Answers: 1(a), 2(b), 3(b), 4(b), 5(c), 6(c), 7(a), 8(c)

A PARTIAL LIST OF INDIANA COMMUNITIES WITH FLUORIDATED WATER*

Aboite Meadows
Advance
Albion
Alexandria
Anderson
Arlington Heights
Auburn
Aurora
Avilla
Batesville
Bedford
Berne
Bloomfield
Bloomington
Bluffton
Boonville
Brazil
Brookston
Brookville
Brownsburg
Brownstown
Bunker Hill
Butler
Cambridge City
Campbellsburg
Carmel
Charlestown
Churubusco
Clearwater Utilities
Columbia City
Columbus
Corydon
Crawfordsville
Culver
Cumberland
Dale
Danville
Delphi
Dune Acres
Decatur
Dunkirk
East Chicago
Edgewood
Elkhart
Elwood
Evansville
Fairmount
Farmland
Flora
Flowing Wells
Forest Hill
Ft. Ben. Harrison
Fortville
Fort Wayne
Fountain City
Fowler
Francisco
Frankfort
Garrett
Gary
Geneva
Glenwood
Goodland
Goshen
Grabill
Grandview
Greendale
Greenfield
Greensburg
Greenwood
Hagerstown
Hammond
Hanover College
Hartford City
Holland
Huntingburg
Indianapolis
Indian Heights
Jamestown
Jasonville
Jasper
Jeffersonville
Kendallville
Kirklin
Knightstown
Kokomo
Lafayette
LaFontaine
LaGrange
LaPorte
Lebanon
Liberty
Ligonier
Logansport
Long Beach
Lowell
Lynn
Lyons
Madison
Marengo
Marion
Martinsville
Mecca
Medaryville
Michigan City
Milltown
Mishawaka
Monon
Monroe
Monroeville
Montgomery
Monticello
Montpelier
Mooresville
Morristown
Morocco
Mount Vernon
Muncie
Nappanee
New Albany
Newburg
New Carlisle
New Castle
New Salisburg
New Whiteland
Noblesville
North Judson
North Vernon
Orleans
Osgood
Ossian
Otwell
Paoli
Pennville
Peru
Pierceton
Pittsboro
Plainfield
Plymouth
Portland
Princeton
Puriton Utilities
Ramsey
Redkey
Rensselaer
Richmond
Riley
Rochester
Roanoke
Rockport
Royal Center
Rushville
Salem
St. Joe
Schererville
Schneider
Scottsburg
Sellersburg
Seymour
Shaded Acres
Shelbyville
Sheridan
Shirley
Silver Lake
South Bend
South Whitley
Speedway
Spurgeon
Staunton
Stucker Fork Utilities
Summitville
Swayzee
Topeka
Union City
Upland
Valparaiso
Van Buren
Veedersburg
Versailles
Vevay
Vincennes
Wabash
Walkerton
Walton
Warren
Warsaw
Washington
Washington Twp.
Waterloo
W. Harrison
West Lafayette
West Lebanon
Whiteland
Winamac
Winslow
Zionsville

* February, 1972

AFFECTIVE QUESTIONNAIRE

I. This form was designed to evaluate the affective activities that you experienced. Please answer as honestly as you can the following questions in regard to what you experienced during the group discussion activities. This is an anonymous form and it will not be used for student evaluation.

Directions: Place a check beside the response which best describes your feelings about the affective activities you have experienced.

1. As a result of today's experience I feel that the instructor
   _____ Fully accepted our feelings
   _____ Partially accepted our feelings
   _____ Grudgingly accepted our feelings
   _____ Rejected our feelings

2. As a result of today's experience I feel the instructor demonstrated
   _____ Much concern for my feelings
   _____ Some concern for my feelings
   _____ Little concern for my feelings
   _____ No concern for my feelings

3. Oral hygiene is
   _____ Very important
   _____ Important
   _____ Not very important
   _____ Of no importance

4. I feel that the affective activity I experienced today was
   _____ Very worthwhile
   _____ Worthwhile
   _____ Of little worth
   _____ Worthless

II. This form was designed to evaluate the affective activities that you experienced. Please answer as honestly as you can the following questions in regard to what you experienced during the group discussion activities. This is an anonymous form and it will not be used for student evaluation.

Directions: Place a check beside the response which best describes your feelings about the affective activities you have experienced.

1. In the affective activity I participated in today I felt that I was
   _____ Very open
   _____ Moderately open
   _____ Moderately closed
   _____ Very closed

2. In the affective activity I experienced today I felt the instructor was
   _____ Very open
   _____ Moderately open
   _____ Slightly closed
   _____ Very closed

3. In my interaction with the instructor I would say that I am
   _____ Very open
   _____ Moderately open
   _____ Slightly closed
   _____ Very closed

4. In the affective activity I participated in today I felt that the group in which I participated was
   _____ Very open
   _____ Moderately open
   _____ Slightly closed
   _____ Very closed

III. This form was designed to evaluate the affective activities that you experienced. Please answer as honestly as you can the following questions in regard to what you experienced during the group discussion activities. This is an anonymous form and it will not be used for student evaluation.

Directions: Place a check beside the response which best describes your feelings about the affective activities you have experienced.

1. In the affective activity I experienced today I felt as if I was taking a
   _____ High risk
   _____ Moderate risk
   _____ Low risk
   _____ No risk
2. In the affective activity I experienced today I felt as if others were taking a
   _____ High risk
   _____ Moderate risk
   _____ Low risk
   _____ No risk
3. In my interaction with the instructor to date I would say that I have taken a
   _____ High risk
   _____ Moderate risk
   _____ Low risk
   _____ No risk
4. As a result of my risk-taking in today's affective activity I feel
   _____ Very good
   _____ Moderately good
   _____ Slightly disturbed
   _____ Very disturbed
5. Risk-taking is something I would like to
   _____ Continue
   _____ Work on
   _____ Forget

IV. This form was designed to evaluate the affective activities that you experienced. Please answer as honestly as you can the following questions in regard to what you experienced during the group discussion activities. This is an anonymous form and it will not be used for student evaluation.

Directions: Place a check beside the response which best describes your feelings about the affective activities you have experienced.

1. In the affective activity I experienced today, I felt as if I were
   _____ Fully leveling
   _____ Partially leveling
   _____ Slightly leveling
   _____ Not leveling

2. In the affective activity I experienced today, I felt as if others were
   _____ Fully leveling
   _____ Partially leveling
   _____ Slightly leveling
   _____ Not leveling

3. In my interaction with the instructor I would say that I was
   _____ Fully leveling
   _____ Partially leveling
   _____ Slightly leveling
   _____ Not leveling

4. As a result of the affective activity I experienced today I feel as though the instructor was
   _____ Fully leveling
   _____ Partially leveling
   _____ Sligh y leveling
   _____ Not leveling

V. This form was designed to evaluate the affective activities that you experienced. Please answer as honestly as you can the following questions in regard to what you experienced during the group discussion activities. This is an anonymous form and it will not be used for student evaluation.

Directions: Place a check beside the response which best describes your feelings about the affective activities you have experienced.

1. As a result of today's affective activity I feel as if I am
   - _____ Fully open
   - _____ Moderately open
   - _____ Moderately closed
   - _____ Fully closed

2. As a result of today's affective activity I feel as if I am
   - _____ Fully leveling
   - _____ Partially leveling
   - _____ Slightly leveling
   - _____ Not leveling

3. As a result of today's affective activity I feel as if I am taking a
   - _____ High risk
   - _____ Moderate risk
   - _____ Slight risk
   - _____ No risk

4. Oral hygiene is
   - _____ Very important
   - _____ Important
   - _____ Not very important
   - _____ Of no importance

VI. This form was designed to evaluate the affective activities that you experienced. Please answer as honestly as you can the following questions in regard to what you experienced during the group discussion activities. This is an anonymous form and it will not be used for student evaluation.

Directions: Place a check beside the response which best describes your feelings about the affective activities you have experienced.

1. Was there any relationship between dental health skills knowledge and the affective activities?
   - _____ High relationship
   - _____ Moderate relationship
   - _____ Slight relationship
   - _____ No relationship

2. As a result of affective activities I learned
   - _____ Much about self
   - _____ Something about self
   - _____ Little about self
   - _____ Nothing about self

3. As a result of affective activities I learned
   - _____ Much about others
   - _____ Something about others
   - _____ Little about others
   - _____ Nothing about others

4. Having experienced affective activities I feel the activities were
   - _____ Very beneficial in teaching
   - _____ Moderately beneficial in teaching
   - _____ Slightly beneficial in teaching
   - _____ Of no benefit in teaching

CONSTRUCTIVE OPENNESS

Rarely do two persons talk openly about their reactions to each other's action. Most of us withhold our feelings about the other (even in relations that are most important or dear to us) because we fear hurting the other, making him angry, or being rejected by him. Because we don't know how to be constructively open, we say nothing. The other continues totally unaware of our reaction to his actions. Likewise, we continue ignorant of the effect our actions produce in him. As a result many relationships that could be productive and enjoyable gradually flounder and sink under the accumulated load of tiny annoyances, hurt feelings, and misunderstandings that were never talked about openly.

The following points increase the probability that openness will improve a relationship rather than harming it.

1. Openness must stem from a desire to improve your relationship with the other; openness is not an end in itself but a means to an end. We are not open with people about whom we do not care. When attempting to elicit an open sharing of reactions to each other, try to convey that this encounter indicates that you value your relation with the other and wish to improve it <u>because</u> it is important.

2. Aim at creating a shared understanding of your relationship. You wish to know how the other perceives and feels about your actions. You wish him to know how you perceive and feel about his actions. Each of you, thus, will view the relationship from more nearly the same viewpoint.

3. Recognize that openness involves <u>risk-taking</u>. You cannot receive a maximum guarantee with minimum risk. Your willingness to risk your self-esteem, being rejected or hurt by the other, etc., depends upon the importance of the relationship to you. Likewise, you cannot ask that the other guarantee not to become angry or feel hurt by your comments. The important point is that you are willing to risk his being himself--whatever he feels--in the effort to make the encounter into a learning situation for both of you.

4. Although the discussion may become intense, spirited, angry, or tearful, it should be <u>non-coercive</u> and not an attempt to get the other to change. Each should use the information as he sees fit. The attitude should not be "Who's wrong and who's right?" but "What can each of us learn from this discussion that will make our working together more productive and more satisfying?"

5. Timing is important. Reactions should be shared as close to the behavior that aroused them as possible so that the other will know exactly what behavior is being discussed. For example, behavior during the encounter itself can be commented on, e.g., "What you just said is the kind of remark that makes me feel pushed away."

6. Disturbing situations should be discussed as they occur rather than saving up massive accumulations of hurt feelings and annoyance and dumping them on the other all at one time.

7. Paraphrase the other's comments about you to make sure you understand them as he intends them. Check to make sure the other understands your comments as you intend them.

8. Statements are more helpful it they are . . . .
Specific rather than general. "You bumped my cup." rather that "You never watch where you're going."
Tentative rather than absolute. "You seem unconcerned about Jimmy." rather than "You don't give a damn about Jimmy."
Informing rather than ordering. "I hadn't finished yet," rather than "Stop interrupting me."

9. The most useful kinds of information are . . . .
Behavior description: reporting specific acts of the other that affect you. "You cut in before I finished my sentence."
Descriptions of your own feelings: "I was irritated when you cut in on me."
Your perceptions of the other's actions: "I thought you weren't interested in understanding my idea."
Perception-checking responses: "Did my remark make you feel put down?"

10. The least helpful kinds of statements are . . . .
Generalizations about the other: "You never pay any attention."
Name-calling, accusative labeling: "You're rude." "You're phony."
Accusations, imputing undesirable motives to the other: "You enjoy putting people down." "You were afraid to hear what I had to say."

PRACTICE (How would you express it?)

1. "When you told me to cheer up it didn't make me feel better. It made me feel that you didn't understand me."
2. "You're too dominating and bossy."
3. "I get annoyed when you give me advice before I have time to think about it for myself."
4. "You seem less interested in understanding what I mean than in convincing me that I am wrong."
5. "Why can't you ever be on time."
6. "You always want to be in the center of attention."
7. "You've spoken more than the others. I'd like to hear what other's ideas are."
8. "When you laugh so hard after a comment like that--that isn't funny--I feel you're making fun of me."
9. "You are too arrogant."

Source unknown.
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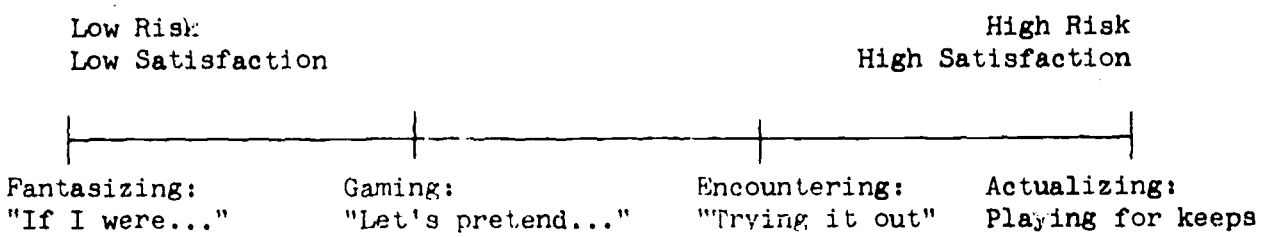
Wayne County Intermediate School District
Staff Development

HOW MUCH RISK DO I TAKE

WITH OTHERS IN THIS CLASS

Four Natural Growth States in the
Process of Self-Definition*



*From Leland W. Howe, "Educating to Make a Difference," Phi Delta Kappan, Volume LII, No. 9, May, 1971.

TIME AND COST FACTORS

Vendor:	Item:		Total:
The Lorvic Corp. 8810 Frost Avenue St. Louis, Missouri	6-2 oz. Bottles Trace for class use 30-1 oz. Bottles Trace for home use	12.40 45.70	$ 58.10
Oral B Company Fairfield Road Wayne, New Jersey	5 dozen "Oral B 30" Toothbrushes @ $ .07 (two per student)		4.20
Oral Health Products P.O. Box 45623 6847 East 40th Street Tulsa, Oklahoma	6-100 yd. dispensers POH unwaxed floss for class use 30-100 yd. dispensers POH unwaxed floss for home use		11.00
Floxite Company, Inc. P.O. Box 1094 Niagara Falls, New York	30-Mouth Mirror Sets with Flashlight (no batteries) @ $6.85		205.50
John O. Butler Company 540 N. Lake Shore Drive Chicago, Illinois	30-#711 Butler Mirro-Lites @ $ .98-1/3 (11.80/dozen)		29.50
Gayee Sales Inc. 916 Burlington Drive Muncie, Indiana	30-Chapstick Lip Balm @ $ .27		8.10
Ryker Dental Depot 426 N. Alabama Indianapolis, Indiana	Cherrin dental throws - box of 500 Mynol applicator sticks - box of 500 Kerr cone socket handles and #5 plain cone socket mirrors (30)	20.00 2.50 65.40	87.90
Ball State University Duplicating Department	Dental Skills Lab Manual - 30 copies Self-Report Dental Inventory - 30 copies Two Handouts - 30 copies	6.29 6.29 2.66	15.24
Ball State University Administrative Stores	Red Pencils (30 @ $ .81/dozen) 3x5 cards (100 @ $ .12) 60 batteries @ $ .15	2.02 .12 9.00	11.14
Ball State University Department of Physiology and Health Science	Ditto mats and paper for two 4-page tests - 30 copies		2.80
Equipment:			
Crutcher Dental Depot 1130 Hume Mansur Building 23 East Ohio Indianapolis, Indiana	1-#150 Emesco Portable Headrest		50.00

Vendor:	Item:	Total:
Ryker Dental Depot 426 North Alabama Indianapolis, Indiana	8 ampules Cetylcide sterilizing solution	7.50
Davies Rose Hoyte Pharmaceutical Division of The Kendall Company 633 Highland Avenue Needham Heights, Massachusetts	1 Kendall Flexible Examination Light 5¼" shaft with turn switch	9.60
National Biological Lab. Division of the Mogul Corp. P.O. Box 482 Oshkosh, Wisconsin	#F0158 Mandible and Maxillae, Hinged	35.00
	TOTAL COST PER CLASS OF 30 STUDENTS:	$535.58

Instructional Supplies
Approximate Per Student Cost

Trace	$ 1.94
Toothbrushes (2 @ .07)	.14
Dental Floss	.37
Floxite Mirror Set	6.85
Miscellaneous[1]	4.55
Instruction Booklets[2]	.60
Per Student Cost:	14.45
30 Students x $14.45	433.50
Additional Equipment[3]	102.10
TOTAL:	$535.60

[1]Includes mirro-lite, chapstick, bibs, sticks, pencils, batteries, cards, exam mirrors.

[2]Includes Lab Manual, Self-Report Dental Behavior Inventory, two handouts, two tests.

[3]Includes a portable headrest, exam light, sterilizing solution, and mannequin.

Instructional Time

The approximate instructional time to implement this model is ten classroom hours (50 minutes each). An additional two or three hours could be used on nutritional aspects of dental health and the suggested periodic reviews.

Qualifications of Personnel

The instructor conducting this program, in addition to being qualified as a health educator, should experience in-service training. The in-service training program should focus on (1) the dental health skills including brushing, flossing, and disclosement; (2) cognitive dental health instruction; (3) affective instruction; and (4) the application of operant conditioning principles to health instruction. A recommended amount of time to complete such an in-service program would be three days. The program should be conducted by dentists and specialists in affective instruction and operant conditioning.

Feasibility of Implementation

To conduct such a program in the given time allotted would require the instructor to be motivated and dedicated to the cause. Preparation time outside of class time to conduct the program is estimated to be one class hour for each instructional hour. The planning and preparation time could be reduced and the program enhanced if an assistant were made available.

A MOTIVATIONAL MODEL TO MODIFY ACTUAL HEALTH BEHAVIOR*

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A dental health instructional project was conducted at Ball State University during the 1972-1973 academic year. The major functions of the project were to: (1) develop and evaluate a motivational model that would improve the dental health behavior of senior elementary education majors and (2) determine the amount and kind of dental health instruction utilized by the elementary education majors during their student teaching experience. An ongoing independent clinical and behavioral evaluation of the project has been initiated by the National Institutes of Health, Division of Preventive Dentistry.

The purpose of this paper is to detail the motivational model and instructional strategies that were developed in the organizational segment and utilized in the experimental segment of the project.

The motivational model (refer to Figure 1) focuses upon dental skills, cognitive information, and affective activity. The model has three (3) phases—Dental Health Skills Instruction, Cognitive Dental Health Instruction, and Dental Health Affective Instruction.

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*The research upon which this publication is based was performed pursuant to Contract No. NIH 72-4295 with the Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, Bureau of Health Manpower Education, Division of Dental Health; Helen Lucye, Project Officer, Alice Fusillo, Assistant Project Officer.

The model begins with formal, controlled laboratory instruction in Phase I, progresses to classroom instruction in Phase II, and ends with informal, participatory instruction in Phase III. As dental skills and cognitive information are learned, their emphasis is reduced to allow for increased affective activity. This integrative process occurs during large group instruction when the instructor "fuses" or integrates skills and cognitions with affective reactions.

The major objective of the skill phase is to provide an environment that enhances the students' "can do" dental skills. The cognitive phase emphasizes the "why do" and the affective phase stresses the "does do," so that the students will transfer the newly learned behaviors to their non-school environments.

Dental Skills Instruction. Phase I, skills instruction, consists of four (4) classroom hours. During this phase, toothbrushing, flossing, disclosing and recording skills are taught to the students in a formal laboratory setting. The instructor determines the skills and instructional behaviors; the class is instructor oriented. Skills are emphasized and the students are motivated by qualifying for home-use dental reinforcers. This phase is evaluated by the level of skill performance by the students.

Slide presentations which precede each lab acquaint the students with specific components of the dental behaviors. Then, the students practice and demonstrate these behaviors in the lab. More specifically, in the area of flossing, the instructional concerns are: (1) the preparation procedure, i.e., the cutting of an appropriate amount of floss, wrapping correctly, and exposing 1/2 inch of floss; and (2) the execution aspect, i.e., flossing distal areas and each interdental space, sawing and sliding the floss into place, and contouring floss

around each tooth and making each tooth "squeaky" clean. In the brushing area, the instructor observes: (1) proper position of the brush; (2) using short back and forth vibratory strokes; and (3) number of placements of the brush. Students experiencing difficulty are assisted by the instructor. The students, working in groups, demonstrate: (1) complete and proper staining procedure; (2) their ability to identify all areas of the mouth with the lighted mirror and reflector; and (3) their ability to identify plaque in their own mouths and in the mouths of their peers. Upon completion of the labs, the students can exhibit effective "can do" dental behaviors.

Cognitive Dental Health Instruction. During the three (3) hours of Phase II, cognitive instruction, the instructor and the students determine the classroom behavior. The climate is less formal than in Phase I and information is disseminated to the students regarding the reasons and rationale for the elicited skills. Dental health conditions are presented to create internal dissonance and/or make the students feel susceptible to dental disease. Individual material reinforcement is replaced by group non-material reinforcement and the reinforcement becomes non-continuous.

Three (3) lecturettes regarding dental diseases, bacterial plaque, and preventive dentistry are included in this phase. The lecturettes consist of slide presentations, student questions, and group discussions. Important information related to the lecturettes is distributed to the students on handouts, thus eliminating the arduous task of note taking. Within the lecturettes, students observe motile bacteria that exists in plaque on a T.V. monitor connected to a phase contrast microscope. The disease concept is emphasized in lieu of an unclean mouth;

it is socially acceptable to have a disease, but not to be unclean or unhygienic. Therefore, plaque accumulation is presented as a disease... the incipient stage of carious lesions and periodontal disease. Floss is conveniently placed around the classroom so that the students may floss during the lecturettes. The lecturettes are evaluated by alternate form multiple choice tests. The students are motivated by the selection of their best test for grading purposes. These procedures are intended to emphasize the "why's" of dental health behaviors.

Affective Dental Health Instruction. Affective activities are initiated for a few minutes at the end of class in Phase I. During Phase II, affective activities increase in both time allotment and intensity. In Phase III, these activities occupy most of the class period. The instructor should be familiar with a variety of activities and utilize the activities that are appropriate for the classroom climate at the time.

Affective instruction is characterized by non-evaluative student-determined behavior for three (3) classroom hours. The classroom climate is informal and the students are organized into small groups to experience affective activities. The activities are designed to generate honest reactions and feelings about dental health. Stress is a natural by-product of the process and the most effective alternative for the students to reduce the stress level is to practice the control behaviors. During the affective instruction, the instructor encounters the students and attempts to isolate the real reasons for not exhibiting control behaviors. When basic reasons are identified, through instructor facilitation, the students usually find reasonable alternatives. Students that are eliciting the control behaviors would not be uncomfortable and in most instances would assist the instructor with encountering and facilitation.

Values are identified and clarified during this phase. The students make a personal value commitment to one another and themselves regarding the dental behaviors they will adhere to in their non-school environments. Value clarification procedures and personal commitment activities specifically related to dental health are used to internally motivate the students to continue the behaviors and include them in their daily repertoire. This is the "does do" phase.

The principles of operant conditioning are used to motivate the students toward dental behavioral objectives. Operant conditioning is a process in which the frequency of a voluntary behavior occurring is modified by the consequences of the behavior. Behaviors that are positively reinforced or rewarded occur more frequently than ignored behaviors. The following operant conditioning principles dictate instructional procedures during skills and cognitive instruction:

1. Internalization: The internalization process improves when qualified students initially receive material, and then later, non-material reinforcement.

2. Performance-based: Performance-based objectives give the students many opportunities to qualify for reinforcement. This instructionally emphasizes the learning of the skills and cognitions.

3. Immediate Feedback and Reinforcement: Immediate feedback and reinforcement after appropriate responses maximizes the effect of the reinforcer and strengthens the students' behavior.

4. Contingencies: Reinforcement procedures that move from individual contingencies to group contingencies increase the social ramifications and helps to maintain student behavior.

5. Scheduling: Reinforcement scheduling that is continuous and then followed by a variable ratio avoids satiation and expedites learning, internalization, and maintainance of student behavior.

In the Affective Instruction Phase, policies related to the laboratory method of learning[1] were utilized to motivate the students to transfer these new behaviors to their non-school environment. The method involves learning from studying one's own behavior, the behavior of others, and interactive behaviors during dyadic and group activities to bring about constructive personal change. The following instructional policies are included to integrate the affective and skill/cognitive instruction:

1. Non-judgmental: Negative feelings of students such as "bored, apathy, and silly" are as permissible as positive feelings such as "involved, interested, and important."

2. Relevant: Students learn what is relevant to them; although all will not learn everything, the instructor hopes the students will learn what is presented for themselves.

3. Openness: Students learn and transfer more when the classroom climate and the relationship with the instructor are open, honest, and comfortable.

4. Risk-taking: Students get more satisfaction from an experience or situation if they take more risks—higher risk, greater satisfaction. Students change after experiencing change, and if they cannot change, it is impossible to change others—higher risk, more change.

5. Commitment/Actualization: Students committed to intelligent and self-fulfilling action will perform the new behaviors for themselves.

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[1]The laboratory method of learning was developed by the National Training Laboratory Institute for Applied Behavioral Science, an independent organization associated with the National Education Association.

Actualization occurs when the new behaviors become an integral part of the students' personal value system and they transmit these values to their family and friends.

A necessary and unique aspect of the motivational model was the development of an internal feedback system in each phase. Although the reliability and validity of the systems are still in the process of being evaluated, preliminary data from the pre-pilot and pilot studies indicate positive results. In Phase I, skills instruction, a Modified Plaque Control Record (M-PCR) is provided for each lab period. The students' ability to demonstrate plaque removal skills is evaluated by the completion of these forms. When the acceptable plaque level for the lab period is achieved by the student, it is then verified by the instructor at an exam station. Students with unacceptable plaque levels must re-attend to the plaque removing skills, re-disclose and verify the achievement of an acceptable level of plaque. Individual lab periods are arranged for students who do not achieve the performance level. The M-PCR is an objective device that gives the students and instructor a quantitative measure of the lab experience.

A self-report inventory and cognitive tests were developed for Phase II. The Self-Report Dental Behavior Inventory (S-R DBI) is designed to record the occurrence and frequency of dental skills practiced in the non-school environment. The inventory is completed anonymously. Each student each day records the behaviors of flossing, brushing, disclosing, and observing. This procedure is used by the instructor to evaluate the application of the control skills by the entire group. Alternate form cognitive dental health tests are used to evaluate the information disseminated during Phase II instruction.

The multiple-choice-questions test the students' knowledge related to: bacterial plaque; rationale for the recommended type of brushing, flossing, and disclosing; diseases of the teeth, gums, and mouth; descriptive dental health statistics; nutritional aspects; fluoridation; and preventive dentistry. Questions were formulated at the knowledge, comprehension, and application levels according to Bloom's Taxonomy of Educational Objectives - Cognitive Domain. The first test is given to the students during the first part of the class period. Then, the test is corrected, returned, and reviewed during the second part of the period. Students that are not content with their score can retest on their own time within 48 hours (two school days) after the test and select the better score for evaluation purposes.

An Affective Questionnaire was designed to give the instructor feedback (if needed) regarding the achievement of the affective objectives. One sheet is organized for each day of affective activity. If the questionnaire yields positive results, the instructor proceeds. However, if the students feel the instructor is "not concerned" or "very closed" or the affective activity is "worthless" or "of no importance," similar activities and group discussion are used to isolate the problem and generate alternative actions. The problem must be identified and solved before skill and cognitive information can be integrated with affective reaction to change behavior. During the instructor summaries, the instructor relates the affective experiences to dental health. This facilitates the integrative process.

Summary and Discussion. This ten (10) classroom-hour instructional model combines skill, cognitive and affective experiences in dental health. An integration of the skills and cognitions with affective

reactions promotes positive feelings and improved values regarding dental health. Motivation principles and feedback systems give the students and the instructor incentive and accountability. The application of this model increases the probability of transference that is necessary to modify health behavior.

As a result of developing the described motivational model and accompanying instructional strategies, the author perceives certain conditions necessary to change behavior via instruction. First, the instructor should be motivated and practicing the behaviors that are being taught. Individuals change after experiencing change and if instructors cannot change or they are not personally commited to the behavior, it will be very difficult for them to change others. Second, instruction should be organized around the skill, cognitive and affective domains. It has been the author's experience that skill-oriented or fact-oriented instruction will not bring about an actual change. Affective considerations regarding values and feelings are critical and essential to permanent changes. Third, motivational procedures related to operant conditioning and the laboratory method of learning should be integrated into the instructional process. These theories have a natural congruency in that the operant conditioning establishes the behavior and the laboratory method of learning maintains the behavior. Fourth, feedback systems must be used to check the behaviors during the instructional process. This action allows the instructor to determine "where he is at" and/or if alternative strategies should be employed. Feedback systems provide credibility and accountability to the health instructional process.

The motivational model attempts to eliminate the known weaknesses in traditional health instruction. There are no radically new concepts in the model and it can be adapted to other health areas.[2] It attempts to coordinate theory with procedure and incorporates empirically-based trends in curriculum and instruction. The model is predicated on the premise that the effectiveness of health instruction must ultimately be measured in terms of the actual health behavioral change experienced by students.

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[2]The author used many of the motivational procedures and instructional strategies in other instructional projects, see Darwin Dennison, "Health Behavior of Preschool Children," The Journal of School Health, June, 1972, Vol. XLII No. 6, pp. 358-359; Darwin Dennison, "Social Class Variables Related to Health Instruction," American Journal of Public Health, June, 1973, Vol. 62 No. 6, pp. 814-820.

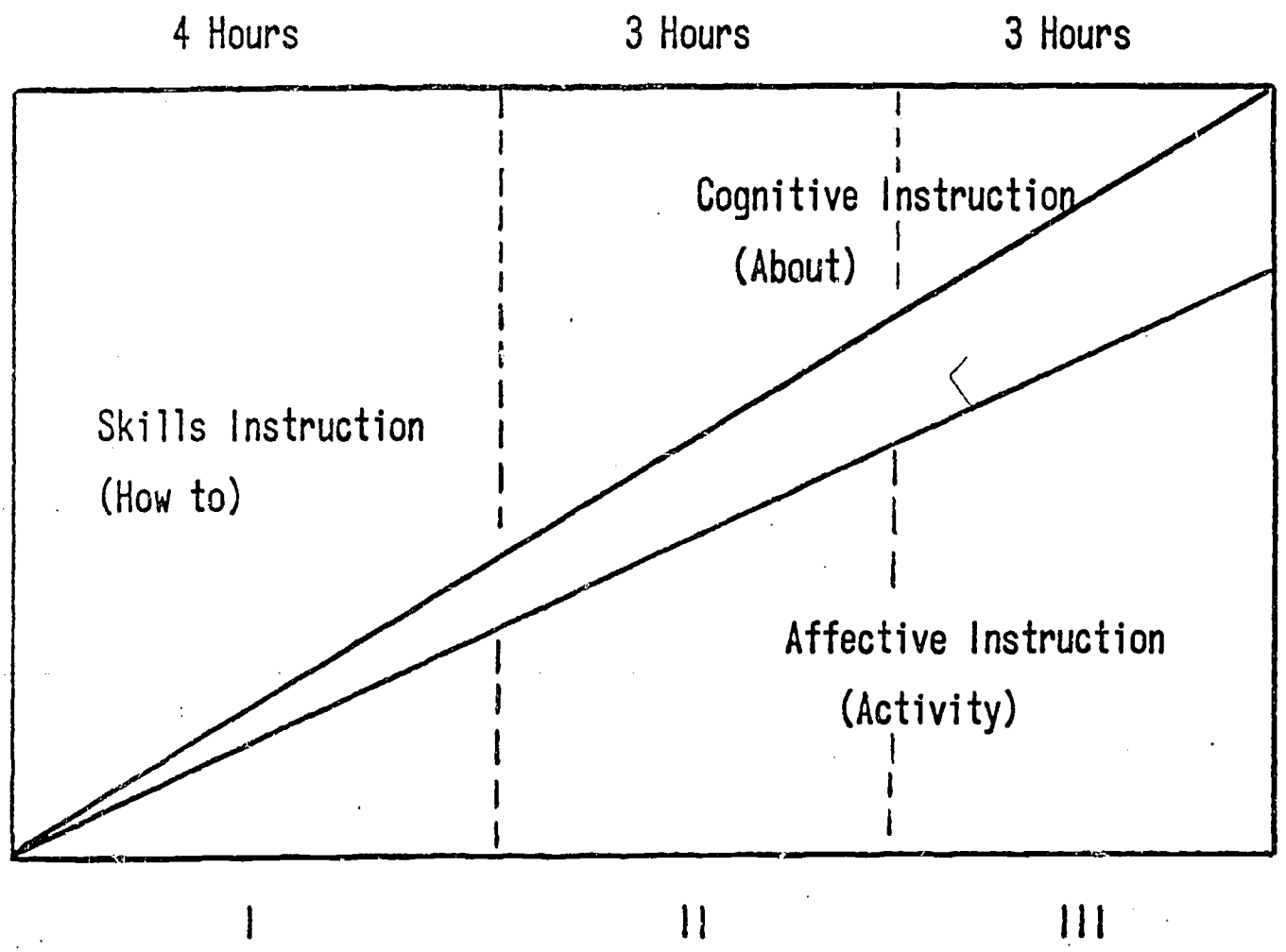

FIGURE I. MOTIVATIONAL INSTRUCTIONAL MODEL

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THE EFFECTS OF DENTAL HEALTH INSTRUCTION UPON UNIVERSITY STUDENTS*

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*The research upon which this publication is based was performed pursuant to Contract No. NIH 72-4295 with the Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, Bureau of Health Manpower Education, Division of Dental Health

Recent technical innovations in dentistry[1-4] have provided sophisticated measures that detect subtle changes in oral hygiene and gingival health. These clinical procedures can evaluate the relationships and effects of independent variables, including instruction, upon dental health behaviors. Studies selected for inclusion in this partial review of literature of school dental health instruction programs utilized these recent innovative measures, or similar measures, to evaluate changes in the students' dental health behavior.

Does dental health instruction change dental health behavior? A study by Brose[5] indicated that following instruction behavior improved, but the improvement could not be directly attributed to a type of instruction. Podshadley[6] and Collier[7] concluded that instruction had no marked effects upon the behavior. The lack of cooperation by the classroom teachers was cited by Collier as impeding the instructional process. Lindhe[8] determined that improved behavior existed only during the supervised instructional periods. Studies by Fodor[9] and Bay[10] produced significant improvement in behavior after instruction, but Bay's follow-up evaluation showed that the behavior returned to pre-instructional levels six months after the instruction. Fodor's study did not have a follow-up evaluation. A study by Williford[11] yielded significant results after instruction and again three months later in the follow-up evaluation. The presence of a dentist conducting the instructional program as the "authoritarian dental image" was indicated as the important factor that produced the significant results. However, the fact that Williford conducted the program and examined the study groups must be considered when evaluating these results.

In the studies reviewed, the length of the instructional periods ranged from one to six hours. The populations included students from fifth grade through high school. Different curricula, motivational procedures, controls, and status of instructors were used. From a design standpoint, two studies[7,9] had independent evaluations and another two studies[10,11] had follow-up evaluations. Different clinical evaluations were employed in the studies. These diversified factors within the studies made it difficult to analyze the results and to formulate protocol for future study. However, instructional factors in the studies that produced significantly improved behavior included the presence of dental personnel[11] and the use of disclosement as a motivator.[9] These factors were integrated into the study described in this paper.

Scope of the Study. The study was conducted during the 1972-1973 academic year at Ball State University, Muncie, Indiana. The purpose of the study was to develop and experimentally evaluate a dental health motivational teaching model to determine its effect upon the dental health behavior of university students.

Elementary education majors were selected as the study population because of their anticipated future special role with children in our society. The elementary education majors would be able to utilize the special dental health information and skills in their student teaching and thereafter. The goal of the Division of Dental Health, U.S. Public Health Service, in funding the project was to determine if the motivational teaching model would motivate the elementary education majors to improve their own dental health. Furthermore, would they in their student teaching experience attempt to pass on to their students the skills and information they themselves had recently acquired, and lastly, would any behavioral

changes induced in the elementary majors persist for a reasonable period following completion of the course of study. It was also anticipated that the motivational teaching model could be utilized in other universities to produce motivated skilled teachers who could improve the dental health of millions of school children. In this report, only the effect of the program on the student teachers themselves will be discussed. The student teaching phase evaluation will be described in a future report.

Motivational Model. The ten classroom-hour motivational teaching model focused upon the principles of operant conditioning and group decision making. The application of operant conditioning procedures to classroom situations has been most effective in initiating new behaviors and modifying established behaviors. The laboratory method of learning was used to motivate student teachers to maintain the new and modified behaviors and to apply these behaviors after the instructional process terminated.

The model had three phases—Dental Health Skills Instruction, Cognitive Dental Health Instruction, and Dental Health Affective Instruction. The model began with formal, controlled laboratory instruction in Phase I, progressed to classroom instruction in Phase II, and ended with informal, participatory instruction in Phase III. As dental skills and cognitive information were learned, their emphasis was reduced to allow for increased affective activity. This integrative process occurs during large group instruction when the instructor "fused" or integrated skills and cognitions with affective reactions. The model was designed to motivate students in the specific tasks of each phase so that the conscious management of dental health behavior would result.

Each phase was organized to accomplish the specific objectives indigenous to the phase. The objectives of each phase were written in measurable terms and each phase was internally evaluated in terms of the stated objectives. The major objective of the skill phase was to provide an environment that enhances the students' "can do" dental skills. The cognitive phase emphasized the "why do" and the affective phase stressed the "does do", so that the students would transfer the newly learned behaviors to their non-school environments.

Procedures. The sample of the study was selected from senior elementary education majors who were enrolled in HSC 350 School Health Practices during the Winter Quarter. School Health Practices is one of two required courses in the Department of Health Science for elementary education majors. The course was designed to acquaint the students with the ramifications of health behaviors, health services, and health instruction methods. The sample consisted of 190 students who were directed into six sections of the course in which three were designated as experimental groups and three were designated as control groups. The students in the experimental groups were instructed via the motivational teaching model during a dental health unit included in the course. The students in the control groups received a less concentrated form of dental health instruction.

The effectiveness of the motivational teaching model was independently evaluated by the Division of Dental Health, U.S. Public Health Service, Bethesda, Maryland. All students were examined by the same examiner. The examiner was not aware of the study status (experimental or control) of the students. The students were not informed in advance that they were to be examined. The same room, equipment, and procedures were used to ensure unbiased measurement.

Two procedures were used in the study to evaluate student performance of dental health behaviors as a result of the motivational teaching model. The Patient Hygiene Performance (PHP)[3] method was used to assess the amount of dental plaque on selected tooth surfaces. In this method, six tooth surfaces were observed after being stained with an erythrosin dye. PHP scores per tooth surface ranged from zero, plaque free, to five, excessive plaque. The Dental Health Center Index (DHCI)[4] was used to assess the status of the gingiva surrounding the teeth. Twelve tooth surfaces were scored for the presence and extent of inflammation. DHCI scores per surface scored, ranged from zero, no inflammation, to two, inflammation encompassing all tissue adjacent to the tooth surface.

The baseline data were gathered at an initial examination at the beginning of the Winter Quarter in November, 1972. During January, 1973, the experimental groups, taught by one instructor, were exposed to the ten classroom-hour motivational teaching model in dental health as a part of the required School Health Practices course for elementary education majors. This dental health unit was terminated two weeks before the second examination in February, 1973. The three control instructors were encouraged to teach their sections as they normally would. They were not encouraged or discouraged to teach dental health. One instructor indicated that he included one hour, incidentally taught, in dental health, while the other two instructors taught one and one-half and three classroom-hour units in dental health, respectively. A follow-up examination was conducted three months later at the end of the Spring Quarter in May, 1973.

Findings. The findings are based on 68 experimental and 90 control subjects who were examined at the baseline, second, and third examinations and who were 30 years of age or younger. The mean age of the participants was 22 years, 9 months; 67.3 percent of the participants were women.

Student's t-test was used to test for significant differences between means (one per cent level).

Table 1 shows mean scores for plaque according to examination and study group. Mean scores for plaque at the baseline did not differ significantly between groups. Plaque scores decreased significantly from the baseline to the second examination in both study groups. The decrease (improvement) in plaque score in the experimental group, however, was significantly greater than in the control group (Table 2). The plaque score for the experimental group increased at the third examination, but did not reach baseline levels. The differences between study groups in (1) mean scores for plaque at the third examination (Table 1) and (2) the mean change from baseline to third examination (Table 2) were not significant.

Mean scores for gingival inflammation are presented in Table 3. At the baseline examination, the mean gingivitis score for the experimental group was significantly greater than the score for the control group. As in the case of plaque scores, mean gingivitis scores for each study group decreased significantly at the second examination. The decrease in the experimental group, however, was significantly greater than in the control group (Table 4). At the third examination, the gingivitis score increased in the experimental group and no significant differences between study groups in either (1) mean scores for gingivitis (Table 3) or (2) the mean change from baseline to third examination (Table 4) were apparent.

Discussion. As might have been anticipated, plaque and gingivitis scores in the experimental group dropped markedly from the baseline to the second examination and then increased at the third examination. Scores at

the third examination, however, did not reach baseline levels. In the control group, plaque and gingivitis scores decreased only one-half as much at the second examination as scores for the experimental group and remained at essentially the same levels at the third examination. Although gingivitis scores at the baseline differed statistically between study groups, the difference was not considered to be of practical importance. That scores for the control group decreased may be explained by the possibility that information related to dental health and dental health practices was exchanged between members of the experimental and control groups. Additionally, control subjects did in fact receive dental health information in their health courses and were provided with dental health materials and consultation services during their student teaching experience.

Unquestionably, the decrease in plaque and gingivitis scores for the experimental group at the second examination represents an important clinical as well as a statistically significant change. The improvement in scores for the control group at the second examination, though statistically significant, was not considered clinically meaningful. Similarly, plaque and gingivitis scores for the study groups at the third examination, though lower than at the baseline, were not considered clinically different from scores at the baseline examination.

The finding of greater plaque and gingivitis scores in the experimental group at the third than at the second examination in this study somewhat parallels the results obtained in another study.[10] Often, a marked decline in oral hygiene and periodontal scores may be noted soon after instruction in dental health and oral hygiene skills. After participants cease to participate in a formal way and cease to receive supervision of their oral hygiene practices, scores tend to increase toward pre-program levels.

The lack of significant differences between groups in plaque and gingivitis scores at the third examination must be partially attributed to an inherent inability of the motivational model to prolong in the experimental group the behavioral improvement that existed at the end of the instructional period. It must be recognized, however, that one injection of instruction does not provide a lifetime immunity. As noted earlier in this report, significant differences were observed between groups in the extent of behavioral change two weeks after the instruction ceased. Between the second and sixteenth week, however, regression of scores toward baseline levels was noted in the experimental group. In future studies, this regression might be reduced through a review system. That is, intermittent reviews would be scheduled during the instructional period to identify subjects who were not adhering to the behaviors and/or who were not performing the behaviors correctly. This procedure would provide additional opportunities to re-establish and maintain the behaviors after the major instructional thrust and thus increase the probability of the behaviors becoming an integral part of the subjects behavioral repertoire.

A significant improvement in the oral hygiene and gingival health of the experimental group was noted at the conclusion of the instructional period. After the instructional period, however, many subjects began their student teaching. Because of possible pressures created by this new experience, recently established habit patterns may have been disrupted. In any event, the instructional phase was not completely successful in prolonging a behavioral change in the experimental group of the magnitude noted at the time of completion of the experimental health course.

Summary. An investigation was conducted to determine the effects of instruction upon the dental health behavior of university students. Experimental subjects were exposed to a dental health motivational model while control subjects received less concentrated instruction. The Patient Hygiene Performance (PHP) and Dental Health Center Index (DHCI) were used to determine oral health changes, and thus, the effectiveness of the instructional model. Baseline, after instruction, and follow-up examinations were conducted. Significant differences in plaque scores and gingivitis scores occurred after instruction in both study groups. However, the experimental group's improvement was significantly greater than the control group's on both measures. The experimental group regressed toward baseline levels on the follow-up examination and no significant differences between groups were apparent at that time.

Table 1

Mean Scores for Plaque by Examination and Study Group

Group	Number	Baseline *		Second		Third	
		Mean	S.E.	Mean	S.E.	Mean	S.E.
Experimental	68	2.80	0.09	1.86	0.10	2.22	0.10
Control	90	2.63	0.08	2.18	0.08	2.29	0.08

*Standard error of the mean

Table 2

Mean Differences in Plaque Scores Between Examinations by Study Group

		Second - Baseline		Third - Baseline	
Group	Number	Mean Diff.	S.E.	Mean Diff.	S.E.
Experimental	68	-0.94	0.09	-0.57	0.10
Control	90	-0.45	0.05	-0.33	0.05

Table 3

Mean Scores for Gingivitis by Examination and Study Group

Group	Number	Baseline		Second		Third	
		Mean	S.E.	Mean	S.E.	Mean	S.E.
Experimental	68	0.99	0.05	0.53	0.04	0.72	0.05
Control	90	0.87	0.04	0.63	0.04	0.65	0.04

Table 4

Mean Differences in Gingivitis Scores Between Examinations by Study Group

		Second-Baseline		Third-Baseline	
Group	Number	Mean Diff.	S.E.	Mean Diff.	S.E.
Experimental	68	-0.46	0.03	-0.28	0.04
Control	90	-0.24	0.02	-0.22	0.02

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