THREE WAYS TO GIVE HEALTH INFORMATION TO COLLEGE STUDENTS

by

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CHAPTER I

INTRODUCTION

Introduction to the Problem

Patients assume an active role in the care of their health. Some of them follow directions carefully while others seem to ignore many or all of the instructions they are given. Health workers wonder whether patients hear or read directions and whether they understand what they read or are told. It is easy to overestimate a well educated person's knowledge of health practices. (1) Information which seems simple and routine to nurses may not be so at all to patients. Agreement does not mean understanding. Health workers too often assume that medical and anatomical terms and unofficial abbreviations are understood when they are not. It is sometimes difficult to find out whether a patient understands. He may be embarrassed to admit that he does not understand. He may think that he understands and in fact misunderstand an entire set of directions. Failure to follow instructions may be due to failure to understand. (10)

Statement of the Problem

The personnel of college health services struggle with different ways to provide health information in an attempt to find the most economical and effective way to communicate with their patients. The media used in this effort are varied and depend to a large measure on the size and preparation of the health service staff and the media available. A combination of oral and written health instructions is found even in small facilities.

College health service personnel find that the personal contact involved in giving oral information is helpful in persuading students to follow directions for self care. Unfortunately oral instruction is time consuming and therefore expensive. The literature includes examples of information forms which have been developed by college health services in an attempt to reduce the amount of time needed to give students self care instructions. Evaluation of the effectiveness of these forms in bringing about desired change in student behavior is based largely on opinion rather than controlled studies.

Purposes of the Study

If printed health information is retained as well or better than oral information, given a student during an interview with health service personnel, a great deal of time and effort would be saved by

providing preprinted material.

This study was undertaken to determine whether students retain information about self care better when it is presented orally or in writing or in a combination of oral and written material.

The hypothesis tested in this study was that there is no significant difference in the effectiveness among these three ways to give health information to college students.

Sore throat was chosen as the illness for discussion with students because it is an illness commonly found in college students and because it lends itself to self care.

Justification of the Study

There is a shortage of data available to assist personnel of college health services in deciding on the effectiveness of one method of providing information as compared with others. With the increase in college enrollment and the decrease in funds for higher education, it becomes pertinent to study factors which may relate to wise use of time and personnel. This study examined three ways of providing health information to college students. Perhaps it will encourage other health service personnel to undertake further study.

Limitations

This study was limited to:

1. Data obtained from 40 students who visited a university health service complaining of sore throat and who expressed willingness to participate in the study.
2. Those students who the university health service nurses deemed to have reasonable sight, hearing, and command of the English language.
3. Data obtained from a written test given to each student during the initial visit to the health service for care of sore throat and repeated during the follow-up visit a week later.

Definitions

The following definitions apply to this study:

Health information is a body of facts regarding illness and self care given to students by qualified health workers.

Sore throat is an inflammatory condition of the pharynx which in this study is not associated with neoplasms, injuries, or foreign objects.

Strep throat is an informal expression meaning streptococcal sore throat.

Procedure of the Study

The steps whereby this study was developed may be described as follows:

1. Relevant literature and related studies regarding the dissemination of health information were reviewed.
2. A statement of the problem and of the purposes of the study was formulated.
3. The problem was delineated with the focus being on the dissemination of health information regarding sore throat.
4. A hypothesis was formulated.
5. A data collection tool was constructed in the form of a test. Each item was devised to elicit information needed to complete the study.
6. The test was submitted to personnel of college health services for evaluation of content and format. The appropriate revisions were made.
7. Written permission was obtained from the president to test the reliability of the instrument at a local college.
8. The test was administered to 40 students enrolled in the college. The test was repeated three days later.
9. The responses were analyzed. Forty-six items were found to be reliable.

10. A statement of information about sore throat was written based on the information included in the reliable test items.
11. Permission was obtained from the director of the health service of a local university to administer the test to student patients of that health service.
12. Conferences were held with members of the staff of the selected health service to acquaint them with the procedures of the study.
13. The health service nurses selected those student patients with sore throat who could read, write, hear, and comprehend English and invited them to participate in the study.
14. The investigator administered the test to 79 students during their first visit to the health service for treatment of sore throat.
15. The students were divided into four groups. Those who received no health information from the investigator comprised the control group. Those who received oral health information from the investigator comprised the "oral" group. Those who received written health information from the investigator comprised the "written" group. Those who received both oral and written health information from the investigator comprised the "both" group.
16. The test was administered one week later to students who

returned for follow-up care until ten students from each group had taken the test twice.

17. These data were analyzed. Tables were constructed. Findings were interpreted.
18. The study was summarized. Conclusions were drawn. Recommendations for further study were made.

Overview of the Study

The report of this study is divided into four chapters. Chapter I contains an introduction to the study, statement of purposes of the study, hypothesis, justification, limitations, definitions, and procedure of the study. Chapter II is devoted to a review of pertinent literature and related studies. Chapter III describes the methodology, the analysis and interpretation of the findings of the study. Chapter IV consists of the summary and conclusions of the study and recommendations for further study.

CHAPTER II

REVIEW OF RELATED LITERATURE AND STUDIES

Introduction

The literature related to the dissemination of health information to college students was reviewed. It was found that much has been published by public health workers and also by those interested in the development of educational theory. The problems of communication were described in numerous instances.

Because this study is concerned with the methods of providing health information to students who visit a university health service, only the literature relevant to such service has been reviewed in this chapter. Included have been some references to educational theory, but only if pertinent to student health services. Omitted have been the numerous references to health education which constitute didactic courses.

Purpose of Health Instruction

Robeschon wrote that the main purpose of health instruction for college students is to guide them to form wholesome health attitudes based on scientific knowledge, healthful habits, and skills

for the benefit of themselves and society. (34) Students must have sufficient health skills and knowledge to behave responsibly in emergencies and make wise choices in matters of health pertaining to themselves and their community. (40) Students must develop a social conscience so that they will see the importance of caring for others as well as themselves. Health instruction for college students should prepare them to be good patients, good workers, and good civic leaders. (14)

Considerations in Giving Health Instruction

The literature indicated that the purpose of health education of the college student is to prepare the student to take care of his own health and to be constructively concerned about the health of other people throughout his life. Health workers tend to agree that providing health information does not guarantee that the information will be assimilated by those who receive it. If health information is given to a person who is not ready for it, it is discarded. Learning is most successful when a person feels a need to know something. When a student asks for information regarding his health problems, he is more likely to listen than during a lecture on the same topic. A college cannot provide a microcosm of health experience a student will encounter during his life. A college will have done a good job if it provides a student with health experience which will give him

knowledge that he can transfer to experiences he has later in life. Transfer of learning is likely when the person is able to see similarities between a new situation and something he has learned. When a student encounters a new situation or problem he will choose a suitable way to attack it and will use his stored facts. Facts can be effectively taught with written material, audio-visual aids, lectures, and discussions. Students remember best those facts which they encounter frequently during their education. Facts and attitude toward facts have a great deal to do with the formation of health habits. Emotional response between teacher and pupil is the basis of attitude formation. The test of successful learning is the successful application of a principle over a lifetime. (11, 16, 19, 33)

Kilander wrote that four outcomes of health education programs are knowledge, attitudes, habits, and skills. Of these only knowledge can be tested with a reasonable amount of accuracy. He wrote that few individuals are found who have sufficient information to take care of their own health needs. He further stated that when a large number of people across the United States were tested, health knowledge varied little from one area to another. In his 20 years of research into the public's knowledge of health, he found that knowledge rose continuously until about the twelfth grade level. Unless specific health instruction was given to college students, the health knowledge of college seniors was very little different from

that of twelfth grade students. He found that college science courses contributed less health information than their high school counterparts. He found a generally positive relationship between health knowledge and practice. (23)

Ways to Give Health Information

According to Farnsworth and others, college students have so little time that health courses are impractical. A college health service should be primarily a teaching unit. Every student visit to the health service has educational potential. Authorities seem to favor informal health instruction of students during other activities such as treatments and physical examinations. (14, 15, 16, 35, 43)

Dale and others have written regarding the use of various teaching aids. Audio-visual aids make learning more permanent but they must be timely and worth the time, effort, and expense involved in using them. Pamphlets, posters, models, exhibits, bulletin boards, newscopy, radio, and writing are included in this review of audio-visual aids because they are used frequently in college health services. The National Health Library receives 1,600 new pamphlets each year. Pamphlets are convenient, concise, and focus the reader's attention on a single topic. It is difficult to prepare a pamphlet which will be meaningful to a wide range of audience. Many pamphlets are not read. Pamphlets, posters, and charts attract

attention, arouse interest and may change attitudes and practices. The same poster seen repeatedly is more effective than one or two posters. Messages conveyed by pictures on posters are easily remembered. Models are useful in clarification of size and function when the original object is inaccessible. Models may be enlargements or miniatures of reality. Exhibits should contain only one central idea which can be understood at a glance. Exhibits should be composed of objects which are seldom seen and should be located where they are readily available to many people. Bulletin boards are particularly good for announcements and news items. They should never be overcrowded. In giving health information, news copy takes the form of news releases, feature stories, editorials, and special columns. All information for the newspaper should be newsworthy and understandable. In giving health information, radio is used for spot announcements, talks, interviews, and round table discussions. Material for radio must be interesting and easily remembered. Good speakers can describe interesting activities to a large radio audience. Unfortunately the speakers are not readily available for questions, and radio stations are easily tuned out. Written material must be individualized to be useful. Letters are personal in approach but are easily misinterpreted. Written material is useful as a reminder of previously discussed information. Written information in the form of bulletins is useful in times of

epidemic to get needed information to members of the faculty. (6, 12, 25, 30, 41, 43)

Face to face contact whether it is the informal health instruction favored by Farnsworth and others or one of the more formal approaches is potentially more effective and more expensive than written communication. Health services use interviews, lectures, forums, panel discussions, and small groups as vehicles for the dissemination of health information. The interview is a major tool of all service professionals. An interviewer must know something of a patient's emotional responses in order to provide suitable learning experiences. Only a few ideas should be given during each interview and all material covered must be summarized at the end of the interview. A lecture is a useful method of presentation when the listeners have little authoritative information. The success of the lecture depends primarily on the effectiveness of the speaker. A forum can be effective when the participating group is articulate and the topic is controversial. A panel discussion can offer several points of view on the same topic. Small groups are useful in giving health information because the group leader has an opportunity to clarify points which are not understood by individual members of the group. In any face to face presentation it is better to give a small amount of specific information than to generalize. The spoken word is the best builder of confidence. (6, 14, 15, 16, 19, 21, 25, 33, 35, 41, 43)

A campaign is a useful way to focus a great deal of attention on a single subject for a short time. All available media should be used in a campaign. The emphasis of a campaign is on health education by repetition. (25)

Most health workers use a combination of several ways to give health information to patients. Samp wrote about the need to present health education aimed at group living. An active group of speakers composed of volunteers from the university health service and medical center was made available to student groups. These speakers served a dual purpose of providing information to students and getting student reaction to current health service practices. Members of the staff contributed to a weekly column in the campus newspaper. This column included both health topics of general interest and information on current health problems. Health forums on special topics were held in student residence halls by speakers from the health service. (36)

Related Studies

In an unpublished masters study made at the University of Oregon School of Nursing in 1966, Weigand gave a written test to 104 patients of a dermatology outpatient clinic in order to find out how much understanding patients have of written health information. The test consisted of six brief paragraphs of health information. Each

paragraph was followed by questions based on information presented in the immediately preceding paragraph. Weigand found that 36 per cent of the sample population was able to profit little or not at all from written health information. Reading level of written material was not a factor in comprehension because the number of correct answers on the tests which were constructed at various grade levels did not differ significantly. She wrote that the literature indicated that personal need is a strong factor in motivation of learning. She concluded that the health information in her study was not needed by dermatology patients. Age, sex, race, place of schooling, number of years of schooling, and occupation were not found to be significant factors in the study. (42)

In a study made at The Cornell Medical Center in New York and reported in the Journal of Chronic Diseases, Seligman et al. studied the level of medical information among clinic patients. Three or four questions were written about the etiology, symptoms, and treatment of each of ten diseases. It was found that patients knew most about diseases their friends had. Information about disease correlated with education level of the patient. The group lacked patients with more than high school education. Patients knew more about diseases which had been the subject of extensive public school campaigns. It was found that symptoms sent patients to physicians. The authors concluded that emphasis in education

campaigns should be placed on symptoms. Patient lack of information should be taken into account in planning their care. Ways must be devised to educate patients better. (38)

In an unpublished masters study made at the University of Oregon School of Nursing in 1967, Ray tested the hypothesis that written discharge instructions do not lessen the number of questions a patient has about his care during the immediate post hospital period. One group of patients was given printed instructions for their home care. The other group received no printed instructions for home care. Ray interviewed each patient in his home one week following his discharge from the hospital. It was found that patients who received printed instructions had fewer questions than patients who received no printed instructions. (32)

In a study made at the University Hospitals of Cleveland in Cleveland, Ohio and reported in Nursing Research, Mohammed studied patient understanding of health information. Five paragraphs of health information, each followed by four multiple choice questions whose answers were clearly stated in the preceding paragraph, were given to 300 patients of a diabetic clinic. It was found that written information at the eighth grade level was probably comprehensible to 22 per cent of the clinic patient population. Forty-three per cent of patients were unable to profit from any written health information. Amount of schooling was found to be the best predictor

of comprehension of written health information. (29)

In a study made at the University of Rochester in Rochester, New York and reported in The Journal of the American College Health Association, Flinn studied a way of giving health information to in-coming college freshmen. A letter of welcome was written to in-coming freshmen by personnel of the college health service. The letter expressed the hope that the health service could be of assistance to them should the need arise. Included in the letter was a section on the common cold, suggestions for self care during colds, and indications of need for professional assistance in treatment of the common cold. Another section of the letter dealt with infectious mononucleosis and was designed to alleviate the panic many students feel about the disease. A third section of information in the letter dealt with simple trauma and urged students to update their tetanus immunization. A section of care of common skin problems was included. In another section, students were urged to seek early assistance with emotional problems from the college psychiatrist and psychologist. Finally students were urged to bring to college a simple first aid kit. The letter was sent to half of the in-coming freshmen who were going to live in dormitories. It was mailed two weeks prior to their arrival on campus. No other material was included in the envelope and the letter was mailed first class. Six months later freshmen records were reviewed by staff members

who did not know which students had been sent the letter. The numbers of student visits for viral and bacterial upper respiratory infections, infections, infectious mononucleosis, minor and major trauma, dermatological complaints, and psychiatric consultation were recorded. The students were divided into two groups, one composed of those who had been sent the letter, the other composed of those who were not sent the letter. No essential difference was found in the number of health service visits made by members of the two groups. Flinn concluded that the letter had had no impact at all. (18)

Feldman wrote a monograph based on the results of a nationwide survey conducted by the National Opinion Research Center during the summer of 1955. The object of the survey was to assess the influence of public beliefs on the use of medical resources. A total of 2,379 individuals were interviewed. Seventy-nine per cent of the people surveyed said that they read or listened to health messages in the mass media. Fifty-three per cent of those who said they read newspapers also read magazines. Forty-one per cent of those who did not read newspapers or magazines said they got health information from the radio and television. Less than 10 per cent of the people surveyed indicated that they obtained health information from professional sources. Feldman concluded that the major hope for increasing the health knowledge of the public was to increase the

educational level of the public. (17)

Summary

The review of the related literature indicated many ways of giving health information to patients. Lacking, however, is a needed body of data regarding the effectiveness of one way of giving information as compared with another way. The related studies indicate that many patients are very confused about their illnesses and care. The need for further study and evaluation of ways of giving health information is apparent from the information in the literature.

CHAPTER III

REPORT OF THE STUDY

Introduction

This study was undertaken to determine whether one way to give health information to college students is more effective than another. College courses in health are impractical because of an ever increasing shortage of student time. (16) College health services are expected to provide students with any needed health information. This puts a burden on health service staff time and therefore on health service budgets. The personnel of health services strive to find ways to give health information which are both economical and effective. Most college health services in the United States use a combination of ways to offer health information to students. The variety of these ways is largely determined by the facilities of the college and the preparation of the members of the health service staff. A combination of oral and written health information is used even in very modest health services. For this reason, oral and written health information were used in this study. College students frequently suffer from sore throat. This disease lends itself to self care. General health information about sore throat is applicable to

most episodes of the illness. For these reasons, sore throat was chosen as the illness for discussion with students.

Procedures

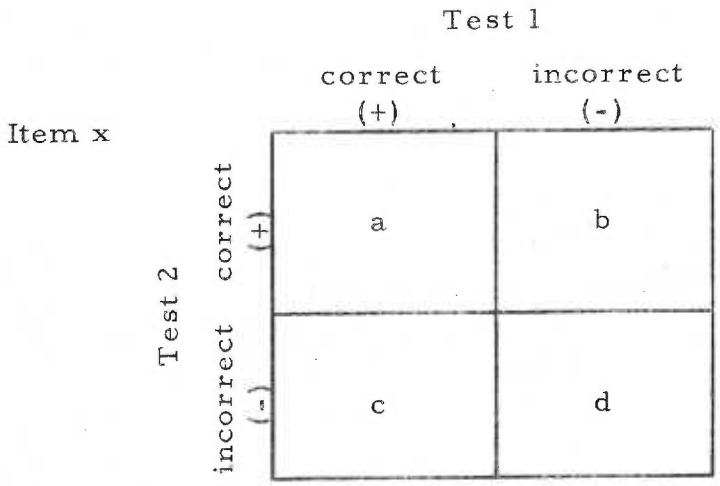
Literature related to sore throat, college health service policies, and ways to give health information to patients was reviewed. On the basis of the literature it was assumed that students who are ill are motivated to get well and are therefore receptive to information about their illness. A test of student knowledge composed of 50 forced choice items about the cause, treatment, and complications of sore throat was written. The items were based on information obtained from the literature and on information commonly given to students by health service personnel. (9, 27) Personnel of college health services evaluated the format and content of the test. Appropriate revisions were made. A sample of the test will be found in Appendix B. This type of instrument for data collection was chosen because it can be answered quickly and because the data derived from it are statistically manageable. The study was developed as outlined in Chapter I.

Reliability of the Test

Permission was obtained from the president of a local college and from a class instructor to give the test to members of a class.

A particular class was chosen because it contained more than 40 members. During a regularly scheduled class period, the students were told that the test was part of a study about sore throat. As many students as wished to do so were invited to answer the test. All of the members of the class volunteered. Each student handed in his test before leaving the room. No attempt was made to ascertain age, sex, education level, social background, or state of health of individual members. The students were not told that they would be asked to repeat the test. When the class met again three days later, each student was given a second copy of the test and asked to complete it before leaving the room. The maximum time taken to complete a test was 20 minutes. A total of 40 students completed both tests.

Item discrimination was established using the Davidoff and Goheen solution to the tetrachoric correlation. (20) Starting from a 2 x 2 table constructed as:



"a" is the number of students who answered the item correctly on both tests; "b" is the number of students who answered the item incorrectly on the first test and correctly on the second test; "c" is the number of students who answered the item correctly on the first test and incorrectly on the second test; "d" is the number of students who answered the item incorrectly on both tests. Table 1 shows the reliability coefficient of each item. Items with a reliability coefficient of .70 or greater were considered to be stable between the first and second test. On this basis, items 2, 16, 21, and 27 were discarded.

The overall reliability of the test was established by comparing the two sets of total test scores. A Pearson product-moment correlation coefficient of .78 was obtained indicating a high degree of relationship between the two tests.

Table 1. Reliability Coefficient for Each Item

Item Number	Reliability Coefficient	Item Number	Reliability Coefficient
(1)	(2)	(1)	(2)
1	.96	26	.84
2	.57*	27	.65*
3	.95	28	.92
4	.88	29	.86
5	.91	30	.89
6	.71	31	.99
7	.96	32	.91
8	.99	33	.96
9	.99	34	.95
10	.78	35	.81
11	.92	36	.92
12	.99	37	.70
13	.96	38	.99
14	.88	39	.99
15	.90	40	.98
16	.55*	41	.88
17	.99	42	.84
18	.82	43	.82
19	.80	44	.70
20	.71	45	.78
21	.67*	46	.99
22	.92	47	.99
23	.85	48	.78
24	.84	49	.85
25	.96	50	.99

*Deleted items

Methodology

A written statement of health information about sore throat was prepared based on the acceptable answers to the reliable items in the test. This statement will be found in Appendix B. Using total scores derived from the reliable items, a 4 x 2 analysis of variance (ANOV) with repeated measures on the second factor was utilized to assess the hypothesis of no difference between groups over tests. (44)

Students who participated in the study were placed in one of four groups depending on whether they had time to receive oral information after completing the first written test. If they were short of time, they were placed in group one or group three. If they had time to discuss sore throat, they were placed in group two or group four. The members of group one (control) completed the written test, were given no health information by the investigator, and a week later repeated the written test. The members of group two (oral) completed the written test, were given oral health information regarding sore throat by the investigator, and one week later repeated the written test. The members of group three (written) completed the written test, were given a copy of the statement of health information about sore throat by the investigator, and one week later repeated the written test. The members of group four (both)

completed the written test, were given both oral information and a copy of the statement of information about sore throat by the investigator, and one week later repeated the written test. Ten students from each group completed the second test.

Whenever the interaction of group by tests was statistically significant, analysis of simple effects (ANOSE) was performed to partition this interaction. Where appropriate, individual comparisons were made utilizing the Newman-Keuls procedure. (44)

Results

As can be seen from Table 2, the interaction of groups by tests was highly significant. This interaction is graphically presented in Figures 1 and 2. Thus an analysis of simple effects was performed. Table 3 shows complete analysis of variance with appropriate analyses of simple effects.

Table 2. Summary of Analysis of Variance

Source	SS	df	MS	F
(1)	(2)	(3)	(4)	(5)
Between Subjects	1195.95	39		
A (groups)	462.45	3	154.15	
Subjects within groups	733.50	36	20.38	
Within Subjects	2746.00	40		
B (tests)	1824.05	1	1824.05	
AB	562.05	3	187.35	18.74***
B x Subjects within groups	359.90	36	10.00	
Total	3941.95	79		

*** $p < .005$

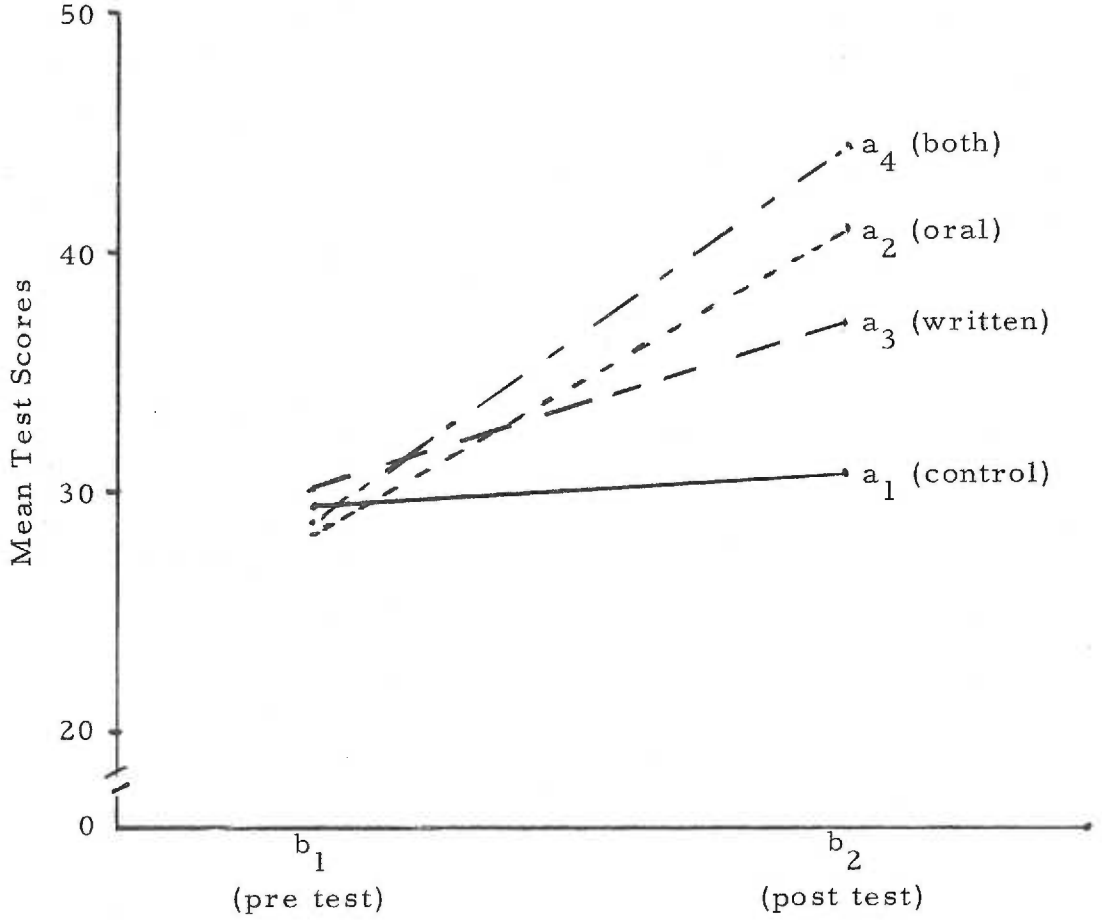


Figure 1. Interaction of Mean Scores for Treatment Grouping of Tests (B_j for Levels of a_i)

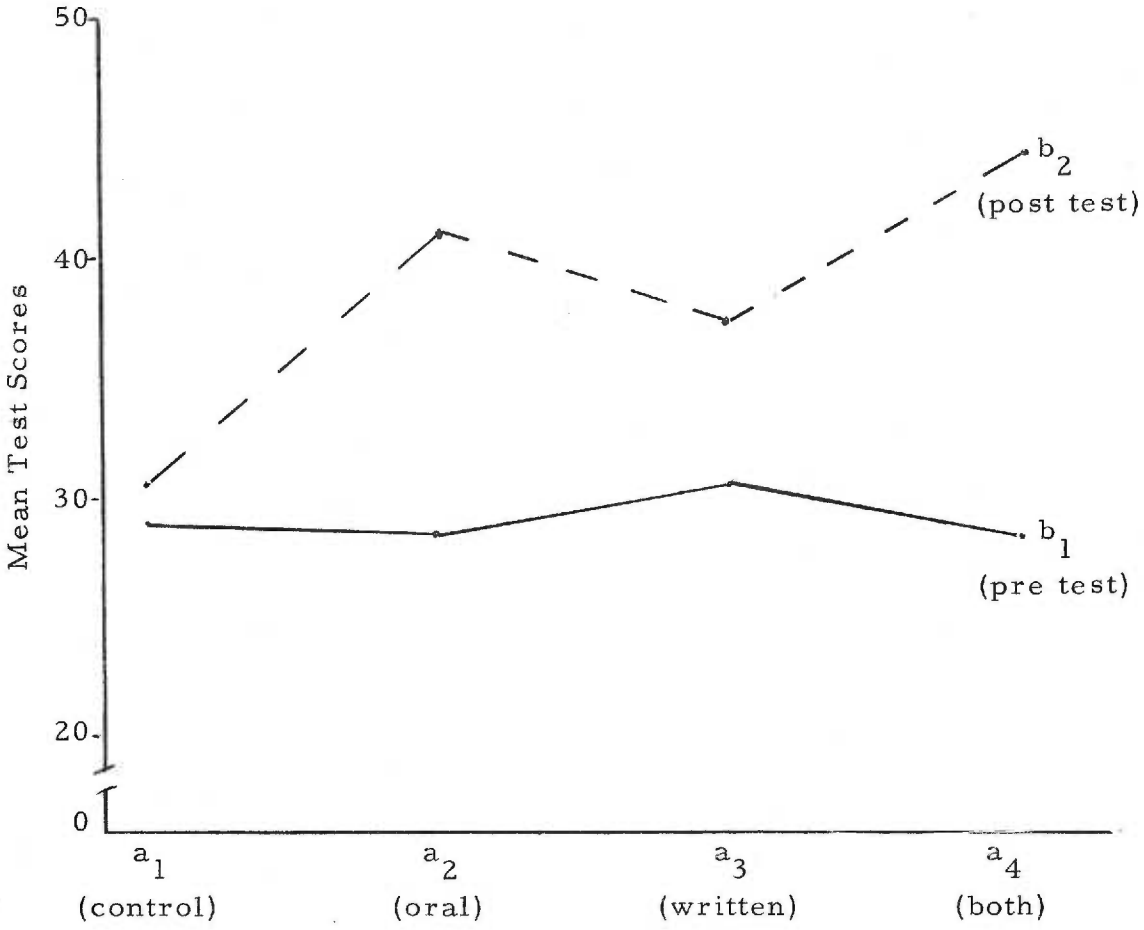


Figure 2. Interaction of Mean Scores for Tests Over Treatment Groups (A_i for Levels of b_j)

Table 3. Summary of Analysis of Variance with Associated Analyses of Simple Effects[1]

Source of Variation	SS	df	MS	F
(1)	(2)	(3)	(4)	(5)
Between Subjects	1195.95	39		
A (groups)	462.45	3	154.15	
A for b_1	33.50	3	11.10	< 1.00
A for b_2	991.20	3	330.40	12.11***
Subjects within groups	733.50	36	20.38	
Within Subjects	2746.00	40		
B (tests)	1824.05	1	1824.05	
B for a_1	8.92	1	8.92	< 1.00
B for a_2	884.45	1	884.45	88.45***
B for a_3	245.00	1	245.00	24.50***
B for a_4	1232.45	1	1232.45	123.24***
AB	562.05	3	187.35	18.74***
B x Subjects within groups	359.90	36	10.00	

***$p < .005$

[1] Tests for between subject Mean Square done with pooled Sum of Squares = 1995.95 with 72 df. Thus pooled MS = 27.29.

As groups over the post test condition (A for b_2) showed a significant difference, it was necessary to perform a Newman-Keuls procedure for testing individual mean differences. Figure 3 is a summary of the Newman-Keuls procedure. The complete procedure will be found in Appendix C.

Treatment Conditions (Post Test)

Control	Written	Oral	Both

Treatments underlined by a common line do not differ from one another. All other treatments differ at the .99 level of confidence.

Treatment Conditions (Post Test)

Control	Written	Oral	Both

Treatments underlined by a common line do not differ from one another. All other treatments differ at the .95 level of confidence.

Figure 3. Summary of Newman-Keuls Procedure for Difference Between Post Test Means

Figure 3 indicates that the post treatment mean scores of groups two (oral), three (written), and four (both) differ significantly from the post treatment mean score of group one (control) at the .99 level of confidence. The post treatment mean score of group four differs significantly from the post treatment mean score of group three at the .95 level of confidence. The post treatment mean score of group three does not differ significantly from the post treatment mean score of group two at the .95 level of confidence. The post treatment mean score of group four does not differ significantly from the post treatment mean score of group two at the .95 level of confidence. Table 4 shows the means and standard deviations of all eight treatment conditions.

Table 4. Means and Standard Deviations for all Eight Treatment Conditions

Group	Pre test	Post test
(1)	(2)	(3)
Control	$\bar{X}$ 28.7 SD 4.40	$\bar{X}$ 30.9 SD 4.01
Treatment 1 (oral)	$\bar{X}$ 28.2 SD 3.62	$\bar{X}$ 41.5 SD 2.32
Treatment 2 (written)	$\bar{X}$ 30.5 SD 4.95	$\bar{X}$ 37.5 SD 5.72
Treatment 3 (both)	$\bar{X}$ 28.4 SD 2.76	$\bar{X}$ 44.1 SD 1.66

Discussion

All four groups of student participants were similar at the beginning of the study as shown by the pre treatment test scores. With the exception of the control group, post treatment group scores were not similar to the pre treatment group scores. Among the four groups, the control group scores showed the least change and the "both" group scores showed the greatest change. Although the difference between the change in the pre and post tests of the oral and written groups is not statistically significant, there is nevertheless a greater change in the oral group.

On the basis of these results it could be concluded logically that the greatest change in knowledge in this study was brought about by a combination of oral and written information. Oral information alone brought about the second greatest change in knowledge. Written information alone brought about change in knowledge less than oral information and considerably less than a combination of oral and written information. Any exposure to knowledge by the methods studied is more effective than no exposure but a combination of oral and written information is more effective than either oral or written information alone.

This study has not shown that student health service personnel can hope to bring about change in student behavior merely by

supplying preprinted health information. This study has indicated that preprinted information is highly useful as reinforcement for oral instructions.

There were certain uncontrolled factors in this study. All participants met the criteria for selection. They were, however, screened by the health service nurse. A further lack of control became evident in the presentation of oral information. Although there were consistent efforts to present the same information in the same way, there is no evidence that phraseology or voice tone were exactly the same in every instance.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary of the Study

The purpose of this study was to find out whether college students retained information better when it is presented orally, or in writing, or in a combination of oral and written material. The general hypothesis tested was that there is no difference in the amount of information retained using these three methods. The study was developed as outlined in Chapter I.

A written test of knowledge containing 50 forced choice items was developed based on information in the literature and on information commonly given students by professional personnel of college student health services. Reliability of the test was determined by administering the test twice to a group of students. Item discrimination was established using the Davidoff and Goheen solution to the tetrachoric correlation. Overall reliability of the test was established by comparing the two sets of total test scores. A statement of health information about sore throat was written based on acceptable answers to the reliable items in the test.

The test was given to university students who visited a

university student health service and who met the criteria of the study. Students were divided into four groups. Group a (control) received no health information from the investigator upon completion of the first test. Group b (oral) received oral health information about sore throat from the investigator upon completion of the first test. Group c (written) received a copy of the statement of health information about sore throat from the investigator upon completion of the first test. Group d (both) received both oral information and a copy of the statement of health information about sore throat from the investigator upon completion of the first test. Students repeated the written test one week following the first test. Each group consisted of ten students. Data were derived from these 80 tests.

Conclusions

On the basis of information obtained during this study, the following conclusions were drawn:

1. The null hypothesis that there is no difference in the amount of health information retained by students whether that information is presented orally or in writing or in a combination of oral and written information was rejected.
2. More health information was retained by students when the information was presented in a combination of oral and written material than by any other method tested in this study.

3. Although the difference in the amount of information retained by the "oral" group was not statistically significant, there was more information retained by this group than by the "written" group.
4. Any exposure to knowledge by the methods studied was more effective than no exposure at all.
5. Preprinted health information is highly useful as reinforcement for oral health instructions.
6. Preprinted health information alone is not adequate to bring about desirable change in a student's care of his health.

Recommendations for Further Study

Based on the information obtained during this study, the following recommendations were made:

1. Conduct a similar study using a different illness to determine the extent to which the illness affected the findings in this study.
2. Conduct a similar study comparing other methods of giving health information to college students.
3. Refine the test and replicate this study in another college setting.

4. Replicate the study using a much longer interval between the two tests to determine whether the gain in knowledge is temporary.

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APPENDIX A

CORRESPONDENCE

2314 Columbia St.
Vancouver, Washington 98660
March 25, 1969

Dwight C. Baird, President
Clark College
Vancouver, Washington

Dear Dr. Baird:

In partial fulfillment of the requirements for a Master of Science degree from the University of Oregon School of Nursing, I am undertaking a study of ways to give health information to students at Reed College. Norman Roberts has said that, with your permission, I may use his geography class to test reliability and validity of the data collection tool. This involves giving the class the same multiple choice test on two successive days. The subject of the test is sore throat.

At this time I am asking administrative clearance to use Mr. Roberts' class for this purpose.

Sincerely yours,

/s/ Maxine E. Roberts
Maxine E. Roberts

Mrs. Roberts is a regularly enrolled student in the graduate program at the University of Oregon School of Nursing. Any assistance you can give her will be appreciated.

Sincerely,

/s/ Lucile Gregerson
Lucile Gregerson
Thesis Adviser

C O P Y

CLARK COLLEGE
Vancouver, Washington · 98663 · Telephone 694-6521

March 27, 1969

Mrs. Maxine E. Roberts
2314 Columbia Street
Vancouver, Washington 98660

Dear Mrs. Roberts:

I am happy to tell you that you are hereby granted permission to use Mr. Roberts' geography class at Clark College to administer reliability and validity tests in connection with fulfilling your requirements for the Master's degree.

We are glad to be of assistance to you in this undertaking.

Sincerely,

/s/ Dwight C. Baird
Dwight C. Baird
President

DCB:do

COPY

PORTLAND STATE COLLEGE
P. O. Box 751 Portland, Oregon 97207 226-7271
Health Service Office of the Dean of Students

May 28, 1969

Ms. Maxine E. Roberts
2314 Columbia Street
Vancouver, Washington 98660

Dear Ms. Roberts:

This will confirm our phone conversation of May 26, 1969 extending permission to you from Dr. Lee Gleason, Medical Director, Portland State University Health Service, to conduct your thesis study in the Health Service. Dr. Gleason will be on campus and available for medical supervision and consultation during the project time.

Please contact me during the latter part of September so that we might make the necessary arrangements pertinent to the student and Health Service operations.

Yours truly,

/s/ Orcilia Z. Forbes
Orcilia Z. Forbes, R. N., M. S.
Administrative Assistant

OZF:lh
cc: Dr. Gleason

APPENDIX B

TEST AND STATEMENT REGARDING SORE THROAT

QUESTIONS ABOUT SORE THROAT

Directions: Read each item carefully and decide which answer best completes the statement or answers the question. There is only one correct answer for each item. Indicate your answer by placing an "X" on the line to the right of the correct answer.

0. The State whose song is "Land of the Empire Builders" is

A. Oregon	a.	X
B. Nevada	b.	
C. Idaho	c.	
D. Colorado	d.	

---

1. A person with sore throat should gargle

A. once a day.	a.
B. every two hours while awake.	b.
C. twice a day.	c.
D. every 15 minutes.	d.

2. An inexpensive, effective gargle is

A. salt water.	a.
B. Listerine	b.
C. Chloraseptic.	c.
D. Micrin.	d.

3. The main reason for gargling is to

A. kill germs.	a.
B. make the throat feel better.	b.
C. reduce fever.	c.
D. reduce the acidity of the throat.	d.

4. Most sore throat is caused by

A. a virus.	a.
B. a streptococcus.	b.
C. smoking.	c.
D. exposure to cold.	d.

5. Aspirin is taken for sore throat to

A. reduce fever.	a.
B. increase the acidity of the throat.	b.
C. decrease the acidity of the throat.	c.
D. prevent headache.	d.

6. The proper amount of aspirin for an adult with sore throat to take is

A. two five grain tablets every 1/2 hour.	a.
B. two five grain tablets every day.	b.
C. two five grain tablets every four hours.	c.
D. two five grain tablets every hour.	d.

7. A person with sore throat should drink more liquid than usual to
   A. wash out the poisons in the blood. a. _____
   B. keep the throat moist. b. _____
   C. prevent the spread of the sore throat to other people. c. _____
   D. reduce hunger. d. _____
8. A person with sore throat should drink at least
   A. two quarts of liquid a day. a. _____
   B. two gallons of liquid a day. b. _____
   C. two pints of liquid an hour. c. _____
   D. two glasses of liquid a day. d. _____
9. Self medication of sore throat should be limited to
   A. aspirin and gargle. a. _____
   B. aspirin and penicillin. b. _____
   C. penicillin and gargle. c. _____
   D. penicillin and cough syrup. d. _____
10. A person with sore throat should spend as much time in bed as possible to
   A. prevent fainting due to weakness. a. _____
   B. allow the body to replenish its food stores. b. _____
   C. conserve energy to use in fighting the illness. c. _____
   D. avoid spreading the sore throat to other people. d. _____
11. Rest helps a person with sore throat get well by
   A. reducing susceptibility to complicating diseases. a. _____
   B. rebuilding muscles. b. _____
   C. increasing the rate of digestion. c. _____
   D. increasing blood circulation. d. _____
12. Smoking should be reduced during sore throat because
   A. smoke irritates the lining of the throat. a. _____
   B. sore throat increases the danger of lung cancer. b. _____
   C. tobacco tastes unpleasant during sore throat. c. _____
   D. the smoke spreads the germs to other people. d. _____
13. Anti-biotics must be taken at regular intervals to
   A. use them in the prescribed time. a. _____
   B. maintain a blood level of medicine. b. _____
   C. keep the throat from hurting. c. _____
   D. keep the throat lubricated. d. _____

14. Nose drops are often prescribed for people with sore throat to
    A. increase the secretions from the nose. a. _____
    B. reduce the danger of ear infection. b. _____
    C. prevent sneezing. c. _____
    D. prevent the spread of the sore throat to other people. d. _____
15. Medicines to dry up sinus secretions are used with sore throat to
    A. reduce sneezing. a. _____
    B. prevent loss of needed body fluid. b. _____
    C. reduce drainage into the throat. c. _____
    D. prevent the sinuses from bursting. d. _____
16. Infections move readily from the throat to the
    A. skin. a. _____
    B. ears. b. _____
    C. stomach. c. _____
    D. eyes. d. _____
17. A virus is
    A. the smallest known parasite. a. _____
    B. the largest known parasite. b. _____
    C. an intestinal worm. c. _____
    D. a by-product of bacteria. d. _____
18. Viruses are killed by
    A. antibiotics a. _____
    B. no known medicine. b. _____
    C. gargles. c. _____
    D. vitamins. d. _____
19. Sore throats caused by a virus often last
    A. only a day or two. a. _____
    B. a week or ten days. b. _____
    C. a month. c. _____
    D. six weeks. d. _____
20. The sore throat we call strep throat is caused by
    A. group A beta hemolytic streptococci. a. _____
    B. Mycobacterium tuberculosis. b. _____
    C. Treponema pallidum. c. _____
    D. Neisseria intracellularis. d. _____
21. A streptococcus is a type of
    A. virus. a. _____
    B. bacteria. b. _____
    C. worm. c. _____
    D. insect. d. _____

22. In treatment of strep throat
    A. all anti-biotics are effective. a. _____
    B. some anti-biotics are not effective. b. _____
    C. no anti-biotic is effective. c. _____
    D. one anti-biotic is effective often. d. _____

23. The medicine of choice against strep throat is
    A. penicillin. a. _____
    B. any anti-biotic. b. _____
    C. not known. c. _____
    D. chlorambicil tablets. d. _____

24. The anti-biotic for strep throat should be taken 1/2 hour before eating because
    A. it is absorbed best by itself. a. _____
    B. it will cause nausea when mixed with food. b. _____
    C. it is difficult to digest. c. _____
    D. food changes its chemical properties. d. _____

25. The medicine used against strep throat can be stopped as soon as
    A. the pain goes away. a. _____
    B. the throat is no longer red. b. _____
    C. the full ten day course is complete. c. _____
    D. the fever is gone. d. _____

26. Strep throats usually improve after
    A. two days on anti-biotics. a. _____
    B. a full course of anti-biotics. b. _____
    C. they run their course. c. _____
    D. the first dose of anti-biotic. d. _____

27. If a strep throat is not properly treated it will
    A. become chronic. a. _____
    B. get well. b. _____
    C. turn into pneumonia. c. _____
    D. remain sore. d. _____

28. One reason for concern about recurrent strep throat is that it leads to
    A. rheumatic fever. a. _____
    B. tonsilitis. b. _____
    C. cancer. c. _____
    D. tuberculosis. d. _____

29. Repeated strep throats lead to
    A. leukemia. a. _____
    B. poliomyelitis. b. _____
    C. cancer. c. _____
    D. none of the above. d. _____

30. Sore throats are spread by
    A. discharge from the nose and mouth. a. _____
    B. wax from the ears. b. _____
    C. urine and stool. c. _____
    D. none of the above. d. _____
31. People have fewer sore throats in summer because
    A. they do not get soaked with rain. a. _____
    B. they are not exposed to severe cold weather. b. _____
    C. they breathe less germ laden air. c. _____
    D. they are less tired in summer. d. _____
32. A person is more likely to get sore throat when he has a cold because
    A. his resistance is low. a. _____
    B. colds and sore throats always go together. b. _____
    C. he does not eat properly. c. _____
    D. sneezing causes sore throat. d. _____
33. A person is more likely to get sore throat when he is
    A. near people who have sore throat. a. _____
    B. tired. b. _____
    C. exposed to bad weather. c. _____
    D. worried. d. _____
34. Professional help is needed for sore throat when
    A. the first signs appear. a. _____
    B. the ears become sore. b. _____
    C. it hurts to swallow. c. _____
    D. the temperature goes above 99°F. d. _____
35. Anti-biotics should not be started before the throat swab is taken because they
    A. confuse the test results. a. _____
    B. make the throat well. b. _____
    C. make some sore throats worse. c. _____
    D. increase secretions in the throat. d. _____
36. A throat swab is
    A. touching the sore area with cotton on a stick. a. _____
    B. breaking open the white spots on the throat. b. _____
    C. an examination of the throat. c. _____
    D. a washing of the throat. d. _____
37. It takes four days to get laboratory results about sore throat because
    A. mails are slow. a. _____
    B. the germ has to be grown. b. _____
    C. the laboratory is overworked. c. _____
    D. tests for more serious diseases are given priority. d. _____

38. Ears are examined during sore throat because
    A. ear infection is a frequent complication. a. _____
    B. they are often full of wax. b. _____
    C. they are part of the routine examination. c. _____
    D. dirty ears indicate poor hygiene. d. _____
39. The proportions of salt water gargle are
    A. one teaspoon salt in eight ounces warm water. a. _____
    B. one tablespoon salt in eight ounces warm water. b. _____
    C. one ounce salt in eight ounces warm water. c. _____
    D. a few grains of salt in eight ounces warm water. d. _____
40. Salt water gargle should be warm because
    A. the salt dissolves more easily in warm water. a. _____
    B. warm water cleans better than cold water. b. _____
    C. warm water is more soothing than cold water. c. _____
    D. warm water kills more germs than cold water. d. _____
41. Sore throats often are more painful
    A. on awaking. a. _____
    B. after meals. b. _____
    C. after gargling. c. _____
    D. at mid-day. d. _____
42. Sore throats are more painful at this time (question 41) because
    A. many people sleep with their mouth open. a. _____
    B. anti-biotics are least effective at this time. b. _____
    C. the head has not been elevated for hours. c. _____
    D. the throat has been in an unnatural horizontal position. d. _____
43. The soreness at this time (question 41) can be relieved by
    A. gargling. a. _____
    B. changing position. b. _____
    C. taking anti-biotics. c. _____
    D. talking. d. _____
44. Normal body temperature is considered to be
    A. 96°F. a. _____
    B. 96.8°F. b. _____
    C. 98.6°F. c. _____
    D. 100°F. d. _____
45. A person with sore throat should get professional help with any temperature
    A. above 99°F. a. _____
    B. above 100°F. b. _____
    C. above 102°F. c. _____
    D. above normal. d. _____

46. Body temperature can often be reduced with
    A. a cool shower. a. _____
    B. a hot bath. b. _____
    C. a hot beverage. c. _____
    D. a cold beverage. d. _____
47. People with strep throat
    A. have more fever than those with viral sore throat. a. _____
    B. have less fever than those with viral sore throat. b. _____
    C. have a high fever always. c. _____
    D. may or may not have high fever. d. _____
48. A throat swab is done to
    A. cleanse the throat. a. _____
    B. get a sample of the germs in the throat. b. _____
    C. apply medicine to the throat. c. _____
    D. make the throat feel better. d. _____
49. White spots on the throat
    A. mean very little by themselves. a. _____
    B. indicate strep throat. b. _____
    C. indicate a viral infection. c. _____
    D. indicate infectious mononucleosis. d. _____
50. Appearance of the throat is
    A. a good indicator of severity of infection. a. _____
    B. a poor indicator of severity of infection. b. _____
    C. a way to determine the amount of pain with a sore throat. c. _____
    D. a way to determine the cause of a sore throat. d. _____

SORE THROAT

Most sore throats are caused by a virus and last for a week or ten days. A virus is the smallest known parasite. At the present time there is no medicine that will kill a virus without killing man also. The sore throat called strep throat is caused by group A beta hemolytic streptococci. A streptococcus is a type of bacteria.

People have fewer sore throats in summer because they breathe less germ laden air. A person is more likely to get a sore throat when he is near another person who has a sore throat. A person is more likely to get a sore throat when he has a cold because his resistance is low. Sore throats are spread by discharge from the nose and mouth. Infections move readily from the throat to the ears.

Appearance of the throat is a poor indicator of the severity of the infection. White spots on the throat mean very little by themselves.

People with strep throat may or may not have fever. Any sore throat with fever over 102°F should be seen by a physician. Normal body temperature is considered to be 98.6°F. Body temperature often can be reduced with a cool shower.

A throat swab is a process of touching the sore area with cotton on a stick in order to get a sample of the germs in the throat. Laboratory results are seldom reported in fewer than four days because the germ has to be grown.

Anti-biotics should not be started before the throat swab is taken because they confuse the test results. One anti-biotic, penicillin, often is effective against strep throat and is the medicine of choice. Anti-biotics must be taken at regular intervals to maintain a blood level of the medicine. Penicillin should be taken one half hour before eating because it is absorbed best by itself. Penicillin as treatment of strep throat must be taken for a full ten days. Strep throats usually improve after two days on anti-biotics.

Self-medication of sore throat should be limited to aspirin and gargle. Aspirin is taken for sore throat to reduce fever. An adult dose of aspirin is two five grain tablets every four hours. The main reason for gargling is to make the throat feel better. A person with sore throat should gargle every two hours while he is awake. Salt water should be prepared with one teaspoon of salt in eight ounces of

warm water. It is an inexpensive, effective gargle. Salt water should be warm because it is more soothing. Sore throat often is more painful on awaking because many people sleep with their mouth open. This soreness can be reduced by gargling.

If the ears become sore during sore throat, a physician should be called. Ears are examined during sore throat because ear infection is a frequent complication of sore throat. Nose drops often are prescribed for people with sore throat to reduce the danger of ear infection. Medicines to dry up sinus secretions are used with sore throat to reduce drainage into the throat.

A person with sore throat should drink at least two quarts of liquid a day in order to wash out the poisons in the blood. A person with sore throat should spend as much time in bed as possible to conserve his energy to use in fighting the disease. Susceptibility to complicating diseases is reduced by rest.

Smoking should be reduced during sore throat because smoke irritates the lining of the throat.

Repeated strep throats lead to rheumatic fever. If a strep throat is not properly treated it will become chronic.

APPENDIX C

NEWMAN-KEULS PROCEDURE

Test on Means Using Newman-Keuls Procedure

	Ordered Means			
Group	Control	Written	Oral	Both
	ab_{12}	ab_{32}	ab_{22}	ab_{42}
Mean	30.9	37.5	41.5	44.1
ab_{12}	----	6.6**	10.6**	13.2**
ab_{32}		----	4.0	6.6*
ab_{22}			----	2.6
ab_{42}				----

r	2	3	4
$q_{.95}(r, 60)$	2.83	3.40	3.74
$q_{.95}(r, 60)s_{\bar{x}}$	4.67	5.61	6.17
$q_{.99}(r, 60)$	3.76	4.28	4.60
$q_{.99}(r, 60)s_{\bar{x}}$	6.20	7.06	7.59

$$s_{\bar{x}} = \sqrt{MS_{pooled/n}} = \sqrt{2.729} = 1.65$$

* $p < .05$
** $p < .01$

Typed by Barbara Glenn

AN ABSTRACT OF THE THESIS OF

MAXINE ELOISE ROBERTS

For the MASTER OF SCIENCE in NURSING EDUCATION

Date of receiving this degree: June 12, 1970

Title: THREE WAYS TO GIVE HEALTH INFORMATION TO COLLEGE STUDENTS

Approved: [redacted]
(Associate Professor, Thesis Adviser

The purpose of this study was to find out whether college students retained information better when presented orally, or in writing, or in a combination of oral and written material.

A written test of knowledge containing 50 forced choice items about sore throat was developed. Reliability of the test was determined by administering the test twice to a group of students. Item discrimination was established using the Davidoff and Goheen solution to the tetrachoric correlation. Overall reliability of the test was established by comparing the two sets of total tests scores. A statement of health information about sore throat was written.

Participants in the study were 40 students who took the test

twice. The participants were divided into four groups. Each group received either no information or received information by one of three methods studied.

Conclusions

On the basis of information obtained during the study, the following conclusions were drawn:

1. The null hypothesis that there is no difference in the amount of health information retained by students whether that information is presented orally or in writing or in a combination of oral and written information was rejected.
2. More health information was retained by students when the information was presented in a combination of oral and written material than by any other method tested in the study.
3. Although the difference in the amount of information retained by the "oral" group was not statistically significant, there was more information retained by this group than by the "written" group.
4. Any exposure to knowledge by the methods studied was more effective than no exposure at all.
5. Pre printed health information is highly useful as reinforcement for oral health instructions.

6. Pre printed health information alone is not adequate to bring about desirable change in a student's care of his health.

Recommendations for Further Study

Based on the information obtained during this study, the following recommendations were made:

1. Conduct a similar study using a different illness to determine the extent to which the illness affected the findings in this study.
2. Conduct a similar study comparing other methods of giving health information to college students.
3. Refine the test and replicate this study in another college setting.
4. Replicate the study using a much longer interval between the two tests to determine whether the gain in knowledge is temporary.