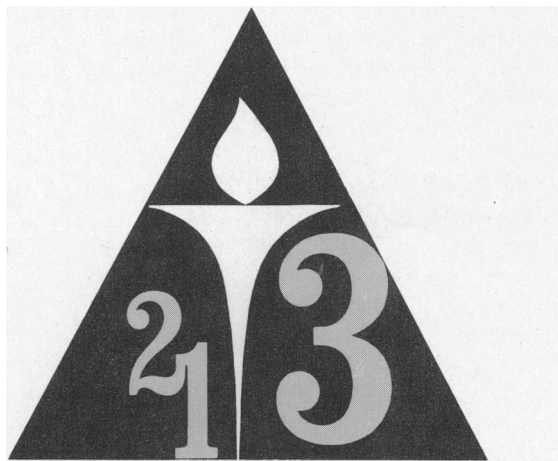


A Comparison of Three Educational Techniques Used in a Venereal Disease Clinic



WALEED ALKHATEEB, MPH, CLINTON J. LUKEROTH, MA.,
and MARY RIGGS, MD, MPH

PLANNED EDUCATIONAL PROGRAMS incorporating information about the characteristics, attitudes, and habits of the people to be served need to be integral components of health care services (1) since the success of a service agency in educating its patients may determine the outcome of a particular program. That success, in turn, may depend upon the educational technique used. Therefore the effectiveness of various educational techniques has been evaluated in a number of studies (2-5). In the present study, also, we have evaluated the effectiveness of techniques for patient education, testing three of them in a venereal disease clinic.

At the time of the study, the authors were with the County of Santa Clara (Calif.) Department of Health. Mr. Alkhateeb was a public health educator in the department's Venereal Disease Control Program; Dr. Riggs was chief of that program; Mr. Lukeroth was a health education associate. Currently, Mr. Alkhateeb is a lecturer in health science, California State University, Northridge, and a doctoral student, School of Public Health, University of California at Los Angeles; Mr. Lukeroth is a health program specialist, Planned Parenthood Association of Santa Clara County; Dr. Riggs continues as chief of the Venereal Disease Control Program.

Tearsheet requests to Waleed Alkhateeb, Department of Health Science, California State University, 18111 Nordhoff St., Northridge, Calif. 91324.

Study Site, Aims, and Methods

The venereal disease clinic where the study was conducted is supported and operated by the Santa Clara (Calif.) Health Department. The clinic is the main public health facility for the diagnosis and treatment of venereal diseases in a county of more than 1 million inhabitants. It serves approximately 23,000 patients per year.

We found the educational efforts of the clinic to be largely unplanned, consisting of sporadic, incidental, and noncomprehensive transfers of information to the patient by whatever staff member happened to take an interest. The aim of our study was to test the effectiveness of educational techniques that might be used to improve a patient's knowledge, attitudes, and behavior in respect to venereal disease. We were also concerned with (a) the feasibility of using one or more of these methods in the venereal disease program in a way that the maximum number of patients would be reached, (b) the efficiency with which one or more of the techniques would convey to the patients accurate information concerning the symptoms, effects, transmission, prevention, and causes of venereal disease, and (c) the patients' reactions to the educational techniques.

A programed learning guide (PLG), an audiovisual (cinematographic) technique (AV), and a person-to-person technique (interview) were selected as the most promising educational methods. The selection was

made on the basis of (a) accuracy of information, (b) comprehensiveness, (c) aesthetics, (d) potential for increasing the patients' involvement in their care, and (e) effectiveness as shown by previous investigators. A programed learning guide developed by Wayne (6) was modified for use in the clinic after review by the clinic's professional and nonprofessional staff. This guide, in booklet form, could be read in 5 to 10 minutes, depending upon the person's reading speed. As an audiovisual method, the Medfact® viewer was selected (A). This self-contained unit resembles a small portable television. Slides from interchangeable cartridges are projected on its screen while a synchronized soundtrack is played.

The interview strategy used had both structured and unstructured elements. A minimum content was established and presented verbally to each designated subject. This minimum content included answers, either direct or indirect, to all items on a questionnaire that the subjects were asked to complete; a number of extraneous items were also included, as was true also in the PLG and AV presentations. Although only 5 minutes were required to cover the minimum content, a maximum of 10 minutes was allotted for each interview. This period allowed for up to 5 minutes of open-ended exchange about issues initiated by the person being interviewed. A health educator assigned to the project conducted all the interviews.

Research Design and Subjects

The modified Solomon design (three-group form—experimental and control) was used to compare the effectiveness of the three educational methods. This design was selected because it allowed for an evaluation of the effects on test results of possible sensitization of the subjects that might be caused by interaction between the pretest and experimental procedures. Also, with this design, internal and external validity could be controlled (7).

To approximate the needed sampling size, Alpha was set at 0.05 and Beta at 0.20. A standard deviation of 3 was estimated; we decided that a difference of 1.5 would be the maximum acceptable error in discrepancy. Applying these figures to the formula for calculation of critical discrepancy, we deduced an approximate sample size of 50 subjects. Since the study was to involve three experimental and six control groups, 450 subjects were selected for possible inclusion, of whom 443 completed the requirements for inclusion.

For any given day during the 6-week study period, approximately half (21 of 40) of the patients visiting the venereal disease clinic for the first time were randomly assigned to the experimental groups, control group 1, or control group 2. The subjects in the experimental group were given a pretest questionnaire and then exposed to one of the three experimental techniques before going through the normal clinical procedures of

Table 1. Percentage distribution of sample populations by sex, age, marital status, and ethnic origin

Variable	Audiovisual technique			Programed learning guide			Interview		
	C1 (N=48)	Exp (N=49)	C2 (N=49)	C1 (N=47)	Exp (N=47)	C2 (N=50)	C1 (N=50)	Exp (N=50)	C2 (N=50)
Sex:									
Male	60	51	69	64	48	60	60	68	70
Female	40	49	31	36	52	40	40	32	30
Age (years):									
Under 15		2		2					
15-19	33	22	41	30	46	34	26	34	26
20-24	29	33	31	36	22	36	30	36	36
25-29	15	27	20	15	20	18	24	20	22
30-35	13	12	6	11	4	6	6	2	6
Over 35	10	4	2	6	8	6	14	8	10
Marital status:									
Single	58	65	82	66	72	64	60	74	60
Married	23	16	4	15	16	14	14	14	14
Divorced	8	10	8	11	6	14	18	6	12
Separated	4	8	6	9	6	4	8	4	14
Widowed	4					4		2	
Other	2								
Ethnic origin:									
White	83	74	76	72	74	78	76	72	64
Black	6	4	8	13	6	6	4	6	8
Mexican-American	6	18	6	13	16	10	16	16	18
Oriental	1	2	4			2		4	8
Other	4	2	6	2	4	4	4	2	2

NOTE: C1—control group 1, Exp—experimental group, C2—control group 2.

Table 2. Comparison between control group 1 and experimental groups of gain in scores according to educational technique used

Items compared	Audiovisual technique		Programed learning guide		Interview technique	
	Control 1	Experimental	Control 1	Experimental	Control 1	Experimental
Pretest mean	13.56	13.61	13.40	12.64	14.94	13.46
Post-test mean	14.39	16.26	14.17	15.36	15.28	17.30
Means of gain in scores	.83	2.65	.77	2.72	.34	3.84
Standard deviation	1.90	2.83	1.50	2.31	1.29	2.29
Standard error	.28	.41	.22	.33	.18	.47
Degrees of freedom		95		95		98
T value		3.71		4.91		7.01
P value		.001		.001		.001

diagnosis and treatment (when indicated). After diagnosis and treatment, they were administered a post-test questionnaire. The average time lag between provision of the educational program and the post-test questionnaire was 1 hour.

Content of Questionnaires

The pretest questionnaire consisted of 20 multiple-choice items. Only those questions relating to information that was adequately dealt with in the programed learning guide, the audiovisual presentation, or the interview were included.

The post-test questionnaire was identical to the pretest questionnaire except that a reactions section was added. (Alkhateeb will supply a copy of the post-test questionnaire and its cover letter, upon request.) This added section consisted of a one-page, five-item form, on which the subject's opinions were asked about whether the length of the experimental technique seemed right, what degree of interest the technique aroused, and its content, scope, and usefulness. Before the post-test questionnaire was used in the study, the staffs of the health department and youth clinic, as well as a college class of epidemiology students, reviewed it, and it was revised on the basis of their suggestions.

Results and Discussion

The percentage distribution of the subjects by four demographic variables is shown in table 1. No statistically significant differences were found among

the nine groups of subjects by sex, age, marital status, or ethnic origin.

The mean gain in scores of the experimental group and control group 1 (that is, the post-test scores minus the pretest scores) was compared to see how much the patients had learned. In general, those exposed to the experimental techniques scored higher than those in the control groups. There were statistically significant increases in scores for all three experimental groups, as measured by *t*-tests for independent means—*t*-tests based on the change in scores (table 2). The increases did not seem to be due to any pretest sensitization because a *t*-test between control group 1 and 2 proved to be significant for all three techniques (table 3).

Because all three educational techniques had a significant effect upon the patients' test scores, *t*-tests between the experimental groups were calculated (table 4). There were no significant differences between the means for the pretest scores. An examination of the means for the post-test scores also revealed no significant differences between the group administered the interview and the other two groups.

We tried to determine whether any subgroups of the study population responded better to the experimental techniques than did their counterparts. Analysis with respect to age revealed no difference between the pretest and the post-test scores of the subgroup over 19 years and those of the subgroup under 19. Sex differences, likewise, apparently did not affect the post-test scores.

Table 3. Comparison of results of tests of significance of the difference between post-test scores of control groups 1 and 2

Item	Audiovisual technique		Programed learning guide		Interview	
	C1	C2	C1	C2	C1	C2
Mean	14.40	15.82	14.17	16.50	15.28	17.50
Standard deviation	3.66	2.58	3.80	2.79	2.90	1.58
Standard error	.53	.37	.56	.40	.41	.23
Degrees of freedom		95		95		98
T value		2.21		3.45		4.76
P value		.027		.001		.001

NOTE: C1—control group 1, C2—control group 2.

Table 4. Results of tests of significance of experimental means for pretest and post-test groups

Group and educational technique	Mean	SD	SE	DF	T value	P value
<i>Pretest group</i>						
Audiovisual	13.61	3.75	.54	97	1.30	.193
Programed learning guide	12.64	3.67	.52			
Audiovisual	13.61	3.75	.54	97	.19	.847
Interview	13.46	4.37	.62			
Programed learning guide	12.64	3.67	.52	98	1.01	.313
Interview	13.46	4.37	.62			
<i>Post-test group</i>						
Audiovisual	16.27	2.25	.32	97	1.46	.144
Programed learning guide	15.36	3.73	.53			
Audiovisual	16.27	2.25	.32	97	2.27	.024
Interview	17.30	2.29	.33			
Programed learning guide	15.36	3.73	.53	98	3.13	.003
Interview	17.30	2.29	.33			

An examination of the subgroups with high and low scores revealed more noteworthy differences. The high and low groups were formed by combining the three experimental groups and then dividing the total into two subgroups on the basis of their pretest mean scores. A *t*-test of the difference between the mean gain in scores of the high and low experimental groups proved highly significant (table 5). As would be expected, the level of knowledge of the low group improved far more than that of the high group. Subjects in the low group improved an average of almost 5 points per person; those in the high group improved only about 1 1/2 points.

Since, however, subjects in both the high and low groups would naturally tend to regress toward the mean during a test-retest sequence, not all of the differences between the high and low groups can be attributed to diverse responses to the experimental techniques (7).

An examination of control group 1 revealed a significant difference between the high and low groups in score gains between the test and retest. In the control group, however, the difference in the gains between the high and low groups was only 0.90, as compared with a 3.26 difference between the gains of the high and low experimental groups. The validity of the comparison of the high and low subgroups, however, is weakened by a ceiling effect for the high group. A subject who scored 18 or 19 on the pretest had less room for gain than someone who scored 10.

The subjects' reactions to the experimental techniques were generally favorable (table 6). The most effective technique was the one that the subjects perceived most favorably. Although the subjects evaluated all three techniques positively, the interview method elicited the most affirmative responses.

Eighty percent of the subjects judged the time consumed by the techniques to be "just right." Just over 24 percent thought the programed learning guide was

"short" to "very short;" only 4 percent said it was "too long." The length of the interview was judged as "just right" by 89.4 percent of the respondents and was never judged to be "too long." Several members of the clinic staff had expressed the opinion that the film's 17-minute length was excessive and might make the subjects bored or impatient. Only 14.9 percent of the AV subjects, however, thought it was "too long;" 78.7 percent believed the length was just right.

Only 17.7 percent of the subjects for whom the programed learning guide was used rated it as "interesting" to "very interesting." In contrast, 85.4 percent of the subjects for whom the audiovisual technique was used and 93.6 percent of those who were given interviews gave these ratings to the technique applied to their group. The question about the amount of new information the subject had received resulted in a more skewed distribution of answers than any other reaction-type question. For all three techniques, the majority reported that they had received "some new information." The rest of the respondents were approximately evenly divided between the categories "lit-

Table 5. Results of tests of significance of difference in gain in scores between experimental high and low groups

Item	High group (N=79)	Low group (N=70)
Mean gain	1.53	4.81
Standard deviation	3.02	1.61
Standard error36	.18
Degrees of freedom	147	
T value	8.40	
P value001	

Table 6. Reactions of subjects to three educational techniques

<i>Educational technique</i> ¹	<i>Percentage of 298 subjects stating that—</i>				
1. "The learning aid was—					
	very short"	short"	just right"	long"	very long"
Audiovisual		6.4	78.7	10.6	4.3
Programed learning guide	2.2	22.2	71.1	4.4	
Person-to-person (interview)		10.6	89.4		
2. "The learning aid was—					
	very boring"	boring"	mediocre"	interesting"	very interesting"
Audiovisual			14.6	64.6	20.8
Programed learning guide		4.4	24.4	51.1	20.0
Person-to-person (interview)		2.1	4.3	72.3	21.3
3. "The learning aid gave me—					
	no new information"	little new information"	some new information"	much new information"	a great deal of new information"
Audiovisual	10.6	14.6	41.7	20.8	12.5
Programed learning guide	6.7	15.6	53.3	6.7	17.8
Person-to-person (interview)		12.8	59.6	19.1	8.5
4. "The information I got from the learning aid is—					
	of no use"	of little use"	of some use"	of much use"	extremely useful"
Audiovisual	4.2		37.5	31.3	27.1
Programed learning guide			33.3	42.2	24.4
Person-to-person (interview)		2.1	38.3	34.0	25.5
5. "As compared with when I first entered the clinic, the learning aid made me feel—					
	very nervous"	nervous"	no different"	relaxed"	very relaxed"
Audiovisual	2.1	8.3	54.2	33.3	2.1
Programed learning guide	2.2	8.9	57.8	24.4	6.7
Person-to-person (interview)		8.5	36.2	44.7	10.6

¹That is, "learning aid."

tle new information" to "no new information" and "much new information" to "a great deal of new information."

A large majority of the subjects in all three experimental groups reported that the information imparted to them by means of the technique was "of much use" to "extremely useful." The rest of the responses fell primarily into the "of some use" category; only 2 to 4 percent reported the information to be "of little use" or to be "of no use." Since, in the question, the word "use" implied behavior, the strongly favorable nature of the answers suggests that persons who suspect they have venereal disease do not regard their situation lightly and that the experimental procedure may have

provided motivation or support for behavioral change.

Would the educational techniques help relax the patient? It was speculated that if the patient's anxiety level could be reduced, he might become a more efficient consumer of medical services (that is, he would ask more questions, and the like). Although time did not permit us to measure the effect of reductions in patients' anxiety, each subject was asked whether or not the particular educational technique had relaxed him. The responses indicated that the audiovisual and programed learning guide techniques did not change the anxiety state of the majority of the subjects. Only one-third of the subjects in each of these two experimental groups reported being relaxed by their

application; 10 percent in fact reported that they were made more nervous by the technique. In contrast, an interview apparently relaxed half of the subjects to whom this technique was applied; it left one-third unchanged and made 8.5 percent more nervous. Person-to-person contact thus seems to afford an opportunity for significantly influencing a patient's emotional state.

Conclusions

Because our study was designed to collect information on the usefulness of three methods of patient education being used in a specific setting—a venereal disease clinic, application of the results of other health services may be limited. This limitation points up the need for similar investigations in other settings. Application of the study results is also limited by the lack of reliable criteria for the construction of an optimal educational technique. Selection of the best programmed learning guides, audiovisual techniques, and interview methods is hampered by lack of data on which to base the selection. Scientifically designed criteria would considerably enhance the generalizability of comparative studies of educational techniques, such as ours.

Although the immediate goal of health education may be to promote learning, the ultimate measure of its efficacy is the extent to which it affects the subject's behavior favorably. The methods we studied do not alone constitute a behavioral change program, but they are one of the elements that might be used in such a program. We made no attempt to investigate the behavioral effects of the three educational methods we studied. Nevertheless, some of the information collected

suggests that these methods may have had some effect on subjects' behavior since they significantly promoted the patients' learning. Some of the study subjects probably will internalize this new information and act upon it because most of them described it as "of much use" to "extremely useful." Additional research delineating the effect of educational programs on patients' behavior is needed if we are to help the large population that is at high risk of venereal disease.

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Equipment Reference

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SYNOPSIS

ALKHATEEB, WALEED (California State University, Northridge), LUKEROTH, CLINTON J., and RIGGS, MARY: *A comparison of three educational techniques used in a venereal disease clinic. Public Health Reports, Vol 90 March-April 1975, pp. 159–164.*

Three communications methods that could be used in educational programs for venereal disease patients were examined as to their relative effectiveness: a programmed learning guide, an audiovisual (cinematographic) technique, and an interview method.

An experimental design was used to study three groups of patients at a venereal disease clinic: (a) persons who were pretested, exposed to an educational method, and tested again, (b) a control group whose members were

pretested and post-tested but not exposed to an educational method, and (c) another control group whose members were exposed to an educational method and then took a post-test. Each of those groups exposed to the educational techniques was further subdivided according to the technique applied.

Analysis of the data collected from 443 subjects led to the following tentative conclusions:

1. Representation in the nine groups was demographically uniform as measured by age, sex, marital status, and ethnic origin.

2. All three educational techniques significantly raised the subjects' level of knowledge about venereal disease, as measured by their test scores.

3. All three techniques were favorably received by the subjects. The majority

reported that the techniques were the right length (10 to 15 minutes), interesting, informative, useful, and anxiety-reducing.

The three techniques apparently accounted for an increase of more than 20 percent in subjects' scores on tests about venereal disease, and the subjects perceived all three techniques as interesting and beneficial. The interview method proved significantly more effective than the other two techniques in raising the knowledge level. It was also the technique most favorably received by the subjects. As expected, those persons who entered the clinic with a low level of knowledge learned much more when exposed to an educational technique than persons entering the clinic with a high level of knowledge. Reaction to the three methods did not differ significantly by the subjects' age or sex.