

# The Efficacy of Personalized Audiovisual Patient-Education Materials

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Patient education is considered an important component of primary care medicine. The traditional methods of patient education have been physician-patient dialogue and printed handouts. This study compares the relative efficacy of pamphlets, one-to-one dialogue, and audiovisual presentations. The results indicate that the slide and sound presentation was most effective in conveying patient information.

Patient education is an important concept in family medicine in the 1980s. Although health knowledge is not synonymous with health behavior, proponents of patient education suggest that attitudes and behaviors conducive to improving individuals' ability to assume responsibility for their own well-being necessarily begin with helping patients to acquire knowledge concerning their own health care.

The need for patient knowledge and behavior change is nowhere more apparent than in the area of contraceptive use. The 562,330 adolescent pregnancies, 271,801 adolescent out-of-wedlock

births,<sup>1</sup> and 378,900 adolescent abortions<sup>2</sup> per year in the United States constitute a glaring failure of contraceptive education. These staggering statistics, coupled with the current interest in patient education, have spurred interest in the development of effective educational materials on the subject.

The traditional method of patient education in contraception is one-to-one physician-patient communication. Although its effects are undocumented, this personalized method is widely judged optimal. There are, however, possible limitations. One drawback is the amount of time required for the physician to provide proper patient education. Also, misinformation or misunderstanding can lead to confusion and lack of confidence in the physician if the patient obtains conflicting information from other sources (eg, friends, media).

In an effort to circumvent time constraints, repetition problems, and biases, many primary care physicians rely on pamphlets for education.

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Unfortunately, new problems are created when using this method. In a survey of 50 women, Sands and colleagues<sup>3</sup> found that only 61 percent of the sample ever read the patient package insert provided with oral contraceptives. These women performed poorly on an examination of contraceptive knowledge, and 38 percent of the sample felt that the information they received was inadequate. Besides its inadequacy in communicating information to the patient, the pamphlet also represents a rather impersonal means of medical communication.

A newer concept in patient education, audiovisual aids, has been undertaken in various realms of patient education. Welk et al<sup>4</sup> used audiovisuals to instruct new mothers on the correct use of rectal thermometers. In another instance, nursing staff members at Luther Hospital in Eau Claire, Wisconsin, developed audiovisual teaching programs to help patients understand, participate in, and respond to treatment.<sup>5</sup> In both cases the audiovisual programs proved very effective. Unfortunately, commercially produced programs cannot be individually suited to the needs of particular patients and physicians, and the production of audiovisuals may be expensive.

Developing a contraceptive education program, therefore, involves certain trade-offs. While one way of providing information may be the most effective method in terms of patient knowledge gain, another may be more cost and time efficient. This study focuses on the current methods of patient education relative to these two major trade-off considerations and provides a comparative analysis of several methods: pamphlet, one-to-one oral communications, slide and sound with physician's voice, slide and sound with an unfamiliar voice, and a combination of pamphlet, oral communication, and slide and sound with physician's voice.

## Methods

Two primary care sites, a clinic and a private physician's office, were involved in the study. Respondents were female patients who presented at either site requesting contraception. The final sample of 100 patients consisted of 70 from the clinic setting and 30 from the private setting. The

sample was predominately white (63 percent), of low income (54 percent had family income of less than \$8,000), and Protestant (85 percent). The mean age of the subjects was 21.5 years, and the mean number of years of formal education was 12.2.

All 100 patients received a presentation of the same information on contraceptive methods extracted from a pamphlet distributed by a leading manufacturer of contraceptives. The pamphlet, published for educational purposes, contains information on the process of conception and six methods of reversible birth control: oral contraceptives, the intrauterine device, the diaphragm, vaginal spermicides, condoms, and the rhythm method. The pamphlet details the advantages and disadvantages of each method and presents rates of effectiveness in tabular form.

Before data collection, the 100 participants were randomly divided into five groups of 20 patients with each group receiving the educational material in one of five ways. The instruction was done on an individual basis before or during the patient's medical examination. The study was briefly explained to each subject, and informed consent was solicited.

The 20 members of group 1 were handed the actual manufacturer's pamphlet and instructed to read it prior to their examination. Fifteen minutes was allotted for reading. Group 2 patients received a slide and sound program with an unfamiliar voice on the tape. The same audiovisual presentation was made to group 3, but the narration was done by the patient's own physician. The 18-minute audiovisual program was shown to the participants before their medical examination and contained information derived directly from the pamphlet to ensure consistent content. While subjects in group 2 were told nothing about the presenter, patients in group 3 were explicitly informed that their own physician was speaking.

For the members of group 4, the physician personally communicated the standard information during the medical examination according to precise instructions designed to keep presentations consistent with information contained in the pamphlet and the slide and sound show. Group 5 received a combination of information media. Before examination, these patients were shown the slide presentation seen by group 3 (physician's voice). The patients were also given the pamphlet, and during the examination they received oral in-

struction. The physicians were not told whether the patients were in group 4 or group 5, but were merely instructed to make the oral presentation.

Evaluation of contraceptive education was accomplished by examining data collected through three questionnaires. A pretest questionnaire was administered to all patients before exposure to information. This 20-item questionnaire was designed to assess subjects' knowledge concerning contraception. After the medical examination, the questionnaire was readministered to each patient (post-test). An additional six questions were included to determine the patient's satisfaction with the information she received and with her office visit in general.

A third questionnaire asked the attending physician to evaluate the patient's understanding of contraceptives at the end of the office visit. The physician was also asked to indicate both the total time spent with the patient and the portion of that time spent discussing contraceptives. These two measures were used as indicators of the efficiency of each information medium in terms of physician time.

Scores were calculated for the subset of 20 knowledge assessment questions. Incorrect answers received a score of 0 and correct answers received a score of 5 (range, 0 to 100). Item scores were summed, and a gain score (post-test score minus pretest score) served as an index of information transmission.

## Results

### Patient Knowledge Gain

An analysis of the pretest scores supported the efficacy of randomization of patients into groups ( $F = .558$ ; mean pretest scores = pamphlet 66.0; slide and sound, unfamiliar voice 64.0; slide and sound, physician's voice 60.8, oral instruction 60.5; and combination 56.5). Table 1 displays the comparative improvement for each group. The group that received a combination of presentations evidenced the most knowledge gain. Subjects who received the oral presentation alone showed the least gain.

Table 1. Pretest to Post-test Improvement

Group	Gain Scores	Standard Deviation
Pamphlet	12.75	12.61
Slide and sound (unfamiliar voice)	26.75	13.98
Slide and sound (familiar voice)	24.00	11.98
Oral	7.75	13.52
Combination	27.00	13.21

$F = 9.131, 4 df, P < .001$

Although the combination group made the most improvement, this change was not significantly different from the increases made by the patients receiving information through the slide and sound presentations alone. The changes made by all three audiovisual groups, however, were significantly better than the pamphlet group or the oral group ( $F = 91., 4 df, P < .01$ ). The difference in improvement scores across various demographic groups (including site of visit) was not statistically significant. Therefore, patient data from the two sites (clinic, private practice) were combined for subsequent analyses.

### Patient Satisfaction

Table 2 indicates that patients who received the combination of presentations were most satisfied with the information, while those receiving the pamphlet were least satisfied.

When asked how much they thought they had learned, patients receiving the information through the combination of presentations felt that they had learned most. Sixty-three percent of the subjects receiving information from their physician felt that they had learned very much from their visit, even though the test scores suggest otherwise. Patients in the pamphlet-only group felt

Table 2. Patient Evaluation of Information Presentation			
Presentation Format	Patient Satisfaction		
	Excellent No. (%)	Good No. (%)	Fair No. (%)
Pamphlet	10 (50)	7 (35)	3 (15)
Slide and sound (unfamiliar voice)	9 (45)	11 (55)	0 (0)
Slide and sound (familiar voice)	14 (70)	6 (30)	0 (0)
Oral	9 (45)	10 (50)	1 (5)
Combination	15 (75)	5 (25)	0 (0)

*F* = 2.309, 4 *df*, *P* < .06

Table 3. Patient Assessment of Knowledge Gain				
Presentation Format	Knowledge Gain			
	Very Much No. (%)	Some No. (%)	Little No. (%)	Nothing No. (%)
Pamphlet	8 (40)	5 (25)	5 (25)	2 (10)
Slide and sound (unfamiliar voice)	12 (60)	8 (40)	0 (0)	0 (0)
Slide and sound (familiar voice)	12 (63.1)	5 (26.3)	2 (10.5)	0 (0)
Oral	13 (65)	5 (25)	1 (10)	1 (10)
Combination	14 (73.7)	3 (15.8)	2 (10.5)	0 (0)

*F* = 2.61; 4 *df*, *P* < .05

that they had learned least. These data are summarized in Table 3.

**Cost Effectiveness**

The amount of time physicians spent discussing contraceptives varied across groups (*F* = 24, 4 *df*,

*P* < .05). In particular, the time spent (mean, 8.3 minutes) when the physicians were told to provide oral instructions (oral and combination groups) was significantly different from the amount of time spent (mean, 5.8 minutes) when the physicians presented the contraceptive information in another manner (*t* = 2.46, 53.47 *df*, *P* < .05). Furthermore, the physicians spent less time with patients who had previously received information (7.0 minutes) than with patients who had not re-

ceived information (9.5 minutes), even though the physicians were blind to the patient grouping.

## Discussion

When choosing a method of presenting patients with information, a physician must consider knowledge gain, patient satisfaction, and cost effectiveness. This study substantiates claims<sup>2-5</sup> that a slide and sound presentation is significantly more effective than traditional methods of patient education in improving patient knowledge. Since the three slide and sound presentations were equally effective, a physician may want to take into consideration factors other than patient knowledge gain (cost, time, and patient satisfaction) when deciding upon an appropriate slide and sound presentation.

Patients were most satisfied when their physician was involved in presenting the information, a fact most apparent in the finding that patients hearing their own physician's voice on the tape were more likely to rate the presentation as excellent (70 percent) than patients hearing the unfamiliar voice (45 percent). In addition, patients receiving the information through the pamphlet, where the physician is furthest removed, were the least satisfied.

The physician "halo effect" is further seen when the patients were asked to indicate how much they thought they had learned. Consistent with the test results, patients in the combination group felt that they had learned most, and patients in the pamphlet group felt that they had learned least. However, when patients receiving the information directly from their own physicians were asked to indicate how much they felt they had learned, the majority of this group (63 percent) felt that they had learned very much, contrary to test results.

A final consideration when choosing educational media is cost effectiveness in terms of both direct expense and physician time. For materials, the slide and sound presentations were the most expensive. The cost for equipment, slides, and tapes was approximately \$500. The other modes of presentation were free of charge.

In terms of time spent, the combination of

media is certainly the most time consuming, for it involves both preparation of an audiovisual presentation and discussions with patients on an individual basis. The pamphlet is the least time consuming—the only effort required on the part of the physician is to obtain leaflets and distribute them to patients, a task that could easily be handled by support staff. When recording the slide and sound presentation, each physician spent approximately 25 minutes for an 18-minute presentation. When the physicians presented the information orally, they talked an average of 10.1 minutes. Since the average length of a family practice visit is 8 to 10 minutes,<sup>6</sup> the examination period is more than doubled when a physician is called upon to present special information, such as contraceptive information, to a patient.

Although the results of this study provide support for the use of audiovisual presentations in patient education, several limitations must be considered. First, the sample size ( $n = 20$ ) of each group is small and may limit the universality of this study. Second, the goal of patient education is to help people change their behavior. Increased patient knowledge is of limited value if it does not subsequently alter patients' behavior. Future research should address whether increased knowledge produced through audiovisual presentations translates into positive behavior change.

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