Educating Patients with Limited Literacy Skills: The Effectiveness of Printed and Videotaped Materials about Colon Cancer

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ABSTRACT

We investigated whether printed or videotaped information is more effective in enhancing colon cancer knowledge. Subjects (n = 1100) were randomized into three groups: to receive a booklet, view a videotape, or receive no intervention. Subjects receiving the intervention showed increased knowledge compared with control subjects (booklet = 23% and videotape = 26% vs no intervention = 3%). Findings suggest that personalized educational materials are effective in enhancing colon cancer knowledge. (*Am J Public Health.* 1994;84:119–121)

Introduction

Colon cancer, the second most common malignancy among men and women in the United States, results in over 61 000 deaths each year.[1] Efforts to reduce colon cancer mortality and morbidity focus primarily on early detection and treatment, given the high survival rate in early stages of the disease.[2–5] Printed materials are commonly used to communicate screening guidelines and detection practices, yet they are often produced at reading levels above that of the intended reader.[6–9] For those with low reading skills, videotapes may offer a significant advantage over printed materials because of their visual appeal. Videotaped instruction has been demonstrated to be as effective as other instructional methods and often more effective than printed materials alone.[10–12] Though the efficacy of written and videotaped methods has been widely reported,[10,13–15] we believe this is the first study to compare the effect of printed vs videotaped colon cancer information on enhancing knowledge among individuals with limited reading skills.

Methods and Measures

Pilot data from 85 clinic patients revealed that most did not recognize that colon cancer was common, were not familiar with American Cancer Society screening guidelines, and felt that a colostomy was necessary when colon cancer was detected. A disparity between stated median educational level (grade 10) and the median reading level as estimated by the Wide-Range Achievement Test II[16] (grade 6) confirmed earlier results.[17]

Instruments

The instruments were produced by the investigators and were based on current cancer literature, a panel of experts, and our pilot data.

Booklet. Bold advance headers introduced the reader to the five sections of the 8½ × 17-inch trifold booklet: facts about colon cancer, facts about the colon and rectum, signs and symptoms of colon cancer, early detection of colon cancer, and a summary. *Colon Cancer: Early Detection Can Save Your Life* was printed in 12-point type with 14-point headers and written at a grade 5–6 reading level.[18,19]

Videotape. Content of the videotape mirrored that of the booklet. Similar headings were placed in the videotape to create visual cues for the viewer. The videotape was filmed in our clinic and showed familiar surroundings. The incorporation of modeling[11] was evidenced by showing patients participating in desired screening behaviors. The videotape was 7½ minutes in length, which approximated the time required to read the booklet.

Pretest/posttest. To evaluate colon cancer knowledge and recall, 24 questions written at grade 5–6 reading level were developed by the investigators and evaluated by a panel of experts. Cronbach's internal consistency alpha coefficient was calculated (r = .63). Questions were systematically divided into two, 12-question tests based on question content, reliability measures, item difficulty, and logical pairing of questions. Each test was comprised of eight true or false and four multiple-choice questions.

Study Population and Data Collection

Subjects (n = 1100) were selected from the Primary Care Clinic at the Milwaukee County Medical Complex, a ma-

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Editor's Note. See related editorial by Zapka (p 12) in this issue.

TABLE 1—Summary of Scores, by Group

	Intervention Groups		
	Control (n = 356)	Experimental-Booklet (n = 370)	Experimental-Videotape (n = 374)
Pretest (range: 1, 12)			
Mean	7.5	7.5	7.4
95% confidence interval	7.3, 7.7	7.3, 7.7	7.2, 7.6
Posttest (range: 0, 12)			
Mean	7.7	9.2	9.3
95% confidence interval	7.5, 7.9	9.0, 9.4	9.1, 9.5
Score difference (range: −5, 10)			
Mean	0.2	1.7	1.9
95% confidence interval	0.0, 0.4	1.4, 1.9	1.7, 2.2
Score improvement (post-pre)/(pre)	3%	23%	26%

TABLE 2—Mean Scores, by Medium (Booklet or Video) and Reading Skill Level

Medium	Reading Skill[a]	No.	Scores (mean ± SD) Pretest	Posttest	Mean Score Difference	95% Confidence Interval
Booklet	Low	184	7.05 ± 1.72	8.6 ± 1.73	1.54	1.23, 1.85
Booklet	High	185	8.05 ± 1.83	9.85 ± 1.60	1.79	1.49, 2.09
Videotape	Low	216	6.89 ± 1.99	8.68 ± 1.79	1.79	1.45, 2.11
Videotape	High	158	8.01 ± 1.60	10.15 ± 1.68	2.13	1.82, 2.44

[a]Low = Wide-Range Achievement Test II score below grade 7. High = Wide-Range Achievement Test II score at grade 7 or higher.

jor teaching affiliate of the Medical College of Wisconsin. Selection criteria included age of 50 years or older, ability to speak and read English, absence of visual and hearing impairments, ability to give free consent, and eligibility for at least one colon cancer screening measure within the recommended interval. Subjects were allocated randomly by the permuted block method into one of three groups: control, booklet, or videotape. All subjects were first given the pretest. Control group subjects received no educational intervention. Other subjects either were asked to read the booklet or view the videotape. All subjects were given the posttest and the Wide-Range Achievement Test II[17] and were questioned about their demographic background. SPSS-X computer programs were used to perform the analyses.

Results

There were no significant differences in age (mean = 60.6 years), race (54% Black, 44% White), sex (72% female), and Wide-Range Achievement Test II Scores among the groups. The median level of reported education was grade 11, and the median reading level estimated by the Wide-Range Achievement Test II was grade 7, a difference of 4 grades. With a one-way analysis of variance, no significant differences were found in the pretest scores among the groups (Table 1). Tukey's Honestly Significant Difference analysis revealed that the difference in posttest minus pretest score between each intervention group and the control group was large enough to be significant at the .05 level of confidence. No statistically significant difference was noted between the booklet and videotape groups.

Subjects in both experimental groups were then divided into four groups according to their Wide-Range Achievement Test II scores (Table 2). Those with grade 7 or higher scores were considered to have high reading skills, whereas those with lower than grade 7 scores were considered to have low reading skills. This definition was based on their expected reading ability within 2 years of the reading level of the booklet. No statistically significant differences in score improvements were found among the four subgroups according to analysis of variance.

Discussion

Both printed and videotaped materials enhanced colon cancer knowledge among patients with limited literacy skills. One possible explanation for this finding is that the interventions were tailored to our target group, with special attention given to developing content relevant to their learning needs, designing the instruments to reflect ethnic diversity, organizing content in a clear manner, using the active voice, writing or narrating in a conversational style, using short words and sentences, incorporating headers and cues, summarizing points, and pretesting the tools.[20–26] The effectiveness of both educational media in enhancing patient knowledge also may have been influenced by consideration of our patients' attitudes towards colon cancer and associated procedures,[27] as well as by the use of the pretest. Our findings support the hypothesis that printed materials written at low reading levels (grade 5–6) can be effective substitutes in clinics without access to expensive audiovisual equipment.[28–30] We recommend that formative and summative evaluations of educational materials be done to ensure that they are acceptable, appropriate, and comprehensible to the target group.[6,20,24]

The inference from our data that both interventions enhanced patients' knowledge about colon cancer should be viewed with caution because only short-term knowledge recall was evaluated. Future studies will be required to determine how long this knowledge is retained and its effect on attitudinal and behavioral outcomes. □

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