

## Patient communication: a multidisciplinary approach using animated cartoons

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### Abstract

**Communication is a major problem in the management of patients. Miscommunication occurs frequently in populations with low reading skills, illiteracy does not completely account for the observed low rates of recall of communicated information. Transmission of the message also plays an important role. Successful strategies to improve communication with patients include the use of videotapes, videotape modeling or cartoon illustrations. Do these products communicate effectively because they overcome illiteracy or because they also transmit a very clear message? Can good transmission of messages overcome illiteracy? In this study, we compared the effectiveness of a printed message about polio vaccinations with the same message converted into a production of animated cartoons using marketing and advertising techniques. The production that resulted from using this strategy showed that in the setting of this study, a well-designed animated cartoon is more effective in delivering a message than the same information provided in written instructional materials.**

### Introduction

For years there have been attempts to improve patient outcomes through educational information

and communication with patients (Doak and Doak, 1980). Some studies indicate that good communication with patients leads to greater patient satisfaction (Waitzkin, 1984), improved adherence to medical regimens (Sanson-Fisher *et al.*, 1989) and good response to treatment of chronic illness (Bartlett *et al.*, 1984). Other studies have documented that lack of communication with patients increases healthcare costs (Leppik, 1990), and gives patients additional fear, unnecessary pain and anxiety about therapy and their diseases (Frith, 1991). There is reason to believe that many patients are unable to follow simple instructions provided in prescriptions, information brochures and/or consent forms because of low English-language literacy levels.

Strategies to improve the communication of patient education include the use of printed materials (Strecher *et al.*, 1994), videos (Meade *et al.*, 1994), computer-based programs (Denville, 1990; Strecher *et al.*, 1994; Lewis, 1996), graphic symbols (Moriyama *et al.*, 1994) and a combination of easy-to-read written materials with added oral instructions (Dixon and Park, 1990; Strand, 1994; Mayeaux *et al.*, 1996). Video programs are among the most successful strategies to improve communication with patients. They have shown a consistent increase in short-term knowledge, and have outperformed plain written materials, lectures and even individual counseling (Gagliano, 1988).

Video educational materials can be as versatile as any television or movie production and can include movement, music, sound, voice-over or dialogues. This varied combination gives a finished video program a great advantage over print media because it can keep the attention of the viewer for longer

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periods of time. This focus of viewer attention is the principal tool that a marketer or advertiser seeks with persuasive intent when producing advertisement media of products or services. In advertising, the main focus of presenting a product or service is to alter the behavior of the viewer, and or his/her levels of awareness, knowledge and attitude toward the product or service offered. Although the final objectives pursued when communicating with a patient are obviously not the same as those of advertising, the focus of the communication with patients and advertising are very similar. The patient needs to be attentive and interested, and in many cases the objective of the educational information and communication with the patient requires altering behavior, levels of awareness, knowledge and attitude toward a medicament or lifestyle.

Health educators can take advantage of the tools used by the marketer and advertiser. The entertainment industry has spent millions of dollars in developing a deep knowledge of customer attitudes and behaviors. Marketers are the best mass communicators. In 20 s, the usual time spent in a promotional advertisement, an advertiser chooses from a substantial array of verbal and non-verbal symbols, words, pictures and colors, to communicate effectively.

Marketing and advertising scientists have a reputation of being atheoretical, and seem not to be interested in explanations, but in prediction and control (Sirgy, 1984). However, two models of human learning, the cognitive-psychological model and the social learning model, have been utilized extensively to explain and predict how consumers behave (Kassarjian, 1974; Moschis and Churchill, 1978). Models of learning theory use two broad categories of factors influencing learning: (1) attributes of the learner and (2) characteristics of the learning situation (Dillon, 1986). Since purchase behavior and attitude change are attributes of the learner, the advertiser must rely on the characteristics of the learning situation to change the attributes of the learner. Advertisers can only influence the viewer by embedding their message into productions that efficiently use color, size and style.

One of the most successful styles of advertising includes animated cartoons. The style is used to entertain and persuade both children and adults. Videogames, television and Internet productions use animated cartoon productions extensively. The productions are exported to different countries with minimal language adaptations, and overcome barriers of culture, age, time and literacy.

Animated cartoons have not been used much in educational information or in communications for patients. There are only a few attempts in the health sector of using cartoon illustrations and pictographs in written materials, but some of these efforts have proved to be effective for conveying information (Delp and Jones, 1996; Houts *et al.*, 1998).

The animated cartoon production for this study included advertising strategies to first capture the attention, interest and desire of the patient by focusing on the production of the message. We first wrote a script based entirely on the printed vaccine information sheet (VIS)—exactly the same words and content were used, the only difference was the story format used in the script. Second, we made a storyboard with the information included in the printed VIS. We used role modeling as the basis for the story in order to promote identification between the parent/caretaker and the parent/caretaker presented in the story. This type of representation is very effective to modify, model or suggest behaviors (Gagliano, 1988) and is used also in advertising (Martin, 2000). Third, we employed a very popular modality used to entertain and promote products and services known as cartoon animation.

In this study, we compared the acquisition of knowledge from a message presented in two formats: (1) printed materials using the polio VIS produced by the Centers for Disease Control and (2) videotape of animated cartoons produced using marketing techniques.

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## Methods

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### Design and setting

We conducted a randomized control trial over a 2-week period at the Pediatric Clinic of Texas Tech

University Health Sciences Center at El Paso. Participants were parents/caretakers of pediatric clinic patients receiving polio vaccines. They were randomized to either a treatment group (video presentation) or a comparison group (reading VIS) using a random numbers table. All parents/caretakers were asked to complete a pre-study questionnaire. They were then randomized either to watch the animated cartoon videotape or to read the VIS. The comparison group was asked to move to a quiet room next to the clinic waiting room to give them some solitude while reading the VIS. The treatment group watched the videotape in the clinic waiting room in the midst of intense patient traffic. Time required watching the videotape was approximately 8 min for both the English and Spanish versions. The comparison group was provided a maximum of 15 min to read either the English or the Spanish version of the VIS. A post-test was administered immediately after the group watched the video or read the VIS.

## VIS

Both the videotape and the VIS contained the same information. The information sheet was presented in a four-page letter-size leaflet with black letters on a pink background. The information contained in the VIS was presented in a question–answer format and included the following questions: What is polio? Why get vaccinated? Who should get polio vaccine and when? Why should some people not get the vaccine? What is the risk associated with the vaccines? Where to call in case of an adverse effect due to the vaccine? The VIS information text contained 1108 words. Readability of the material was rated at a 7.7 Flesch–Kincaid grade level.

## Animated cartoon videotape

The educational videotape was produced by a multidisciplinary team that included physicians, nurses, a marketer and graphic designers. The video consisted of a story produced in animated cartoons that portrayed a mother taking her baby to the pediatrician to receive the polio vaccine. In the story, the baby does not like the vaccine, but

the program emphasizes how there is actually very little discomfort. The information included in the videotape was the same information contained in the VIS regarding the vaccine, vaccination risks and contact information in case of an adverse effect.

## Survey questionnaires

Two questionnaires were designed for this study. The pre-test (baseline) included demographic information (age, ethnic origin, educational level and children) and five questions related to understanding of the polio vaccine. The post-test included the same five questions contained in the pre-test as well as three additional questions. They were added because they covered specific information included in both the VIS and the videotape in animated cartoons. Questions were asked in a yes/no or a multiple-choice format, and were based on VIS information.

## Data and statistical analysis

Multiple choice and yes/no questions were coded as ‘0’ if correct and ‘1’ as incorrect. Data were analyzed by using a SPSS program that included univariate and multivariate analysis, *t*-test for testing the significance of differences between the means of two populations, and frequency distributions. All parent/caretakers attending the Pediatric Clinic of Texas Tech University Health Sciences Center at El Paso for polio vaccines were eligible for participation and none was excluded except for failure to participate or complete the questionnaires.

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## Results

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Approximately 98% of eligible parents who attended the clinic for polio vaccines agreed to participate. In total, 206 questionnaires were distributed among potential participants. Of these, 16 (7.4%) were not completed because of time constraints. Eight questionnaires were discarded because they were incomplete, leaving 192 (88.9%) usable questionnaires: 96 complete data sets were available for participants who viewed the video and 96 complete

**Table I.** Mean scores and mean changes comparing comparison and treatment groups

Questions	Treatment ( <i>N</i> = 96) <sup>a</sup>	Comparison ( <i>N</i> = 96) <sup>a</sup>	Treatment versus comparison <sup>b</sup>	<i>P</i>
Total score (pre-test number correct 0–5)	3.04 (1.11)	2.99 (1.18)	0.05 (–0.275 to 0.3790)	0.754
Total score (post-test number correct 0–8)	6.24 (1.70)	5.03 (1.90)	1.21 (0.694 to 1.72)	<0.001

<sup>a</sup>Mean (SD).<sup>b</sup>Mean differences (95% confidence intervals).

sets were available for subjects who read the VIS. There were no statistically significant differences between treatment and comparison groups regarding age, educational level, gender and ethnicity. However, in both groups, women and Hispanics were predominant.

There was not a statistically significant difference between the two groups' pre-treatment knowledge in relationship to the material presented. The number of correct responses in the treatment and the comparison group were 3.04 and 2.99, respectively (Table I). Post-test changes in knowledge scores were significantly greater in the treatment group when compared to the comparison group. Both groups scored higher in the number of correct responses in the post-test when compared with the pre-test. However, a total of 29 (30.2%) of the participants in the videotape group responded to all questions correctly, while none of the participants on the printed group responded correctly to all the questions.

## Discussion

Several important aspects should be considered from the results of this study. Most clearly, a message transmitted well using marketing and advertising techniques in animated cartoons can improve knowledge among parents/caretakers regarding polio vaccination. In addition, the same message processed in a more interesting colorful format transmits the message more efficiently. This is reflected in a shorter time for training, better understanding, less supervision, the ability to replicate the material on the Internet and, finally, the

advantage of communicating more effectively with patients independent of the level of literacy. Many educational programs designed to communicate with patients are developed on very low budgets, but when they fail, the cost is inestimable. The production cost of the videotape used in this study was US\$6000 dollars. The material used in the videotape was taken from the information in the VIS, produced by the Centers for Disease Control from the US Department of Health and Human Services; therefore, the preparation of the material did not include any additional consultant expenses. The production took approximately 6 weeks and required a few hours of supervision after the planning process took place. The results showed that parent/caretakers liked and learn from the material. Our experience is that parents/caretakers may not even read the printed material because they leave it in the clinic.

Based on this study, several recommendations might be considered for future interventions. Our educational product used animated cartoons, a popular modality in the entertainment industry. In our hands, the product yielded a positive educational advantage over printed materials. In other studies, educational efforts using static non-animated cartoons have indicated that their use may facilitate communication between health care providers and receivers (Moriyama *et al.*, 1994). Therefore, other studies including the use of animated cartoons for health educational purposes should be conducted and compared with the results obtained in this study. In addition, it is important to measure the lasting impact on the attitudes, belief and behavior of patients by using material produced using marketing and advertising tools.

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