Development and Evaluation of a Sexual Decision-Making and Social Skills Program: "The Choice Is Yours—Preventing HIV/STDs"

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A series of interactive videodisc programs designed to reduce HIV/STD risk behaviors was developed and evaluated. Separate programs were developed for each of three race/ethnicities (African American, Hispanic, and Caucasian) at each of two age levels (middle school and high school) using extensive formative procedures. Each program uses scenarios with extensive branching story lines to teach decision-making skills and socially appropriate responses to potentially risky sexual situations. In a randomized experiment with 827 students, significant changes were observed at posttest for the four constructs assessed: (1) belief that sex occurs as a result of decisions (vs. "it just happens"), (2) belief that even a single incident of unprotected sex can result in an STD or pregnancy, (3) intentions and attitudes toward use of condoms, and (4) self-efficacy in remaining abstinent (i.e., avoiding sex). At 30-day follow-up, three of the four measures remained significant.

INTRODUCTION

Adolescents are an important target for interventions to reduce the prevalence of behaviors that risk transmission of sexually transmitted diseases (STDs), including human immunodeficiency virus (HIV). The age-specific prevalence rates of several STDs are highest among teenagers,[1,2] and HIV prevalence rates for young adults imply that a large number of infections are occurring during the teenage years.[3] Furthermore, many diverse samples of adolescents report high rates of risky sexual behaviors.[4-7]

Different groups of adolescents have different concerns, interests, sensitivities, and risks.[8,9] Thoughtful attention to cultural variations thus is necessary for interventions to be optimally effective. Although an issue may well be generalizable across most groups of adolescents (e.g., risk of contracting an STD), the degree to which adolescents in a specific group (e.g., a specific race or ethnicity) feel that the messages in a specific intervention apply to them may be influenced greatly by the match between the message (or who is delivering it) and the adolescent.[8,10]

The medium used to communicate intervention messages is also important.[11,12] Video is an often-used medium for interventions with adolescents, as well as with other

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ages.[10,13,14] Interactive video, in particular, offers a number of advantages for tailoring interventions to the needs of different groups.[14,15] Recent evidence has made it quite clear that tailoring interventions is associated with increased impact of the message.[16,17]

In order to create an intervention to help reduce the spread of HIV and other STDs among adolescents, we developed and evaluated a set of culturally tailored interactive videodisc-based programs that promote safer sexual practices, including abstinence. Our intention was to produce programs that would extend beyond existing curricula, especially those that primarily are fact based.

We used the interactive videodisc format because (1) it provides a unique opportunity to practice decision-making and social skills relevant to potentially risky sexual situations (showing the results of those decisions in a realistic manner), (2) it allows precise and rapid remediation of inappropriate (i.e., high-risk) behavior, (3) it can be specifically tailored to the characteristics and needs of the audience and thus be especially effective,[18] (4) it focuses attention and increases time-on-task compared to passive (noninteractive) media (such as linear video),[19] and (5) it is easily disseminated.

Unlike video programs that are designed to promote or "trigger" general discussions of risky sexual practices, our programs were designed with more specific skill-building goals, although our programs do also include situation-specific discussion points supported by on-screen discussion questions. Our programs primarily were designed to (1) provide the decision-making skills and information necessary to make competent decisions and (2) teach the social skills needed to deal safely with sexual situations. For maximum relevance and impact, a total of six separate videodiscs was produced, each targeting a specific group based on ethnicity (non-Hispanic Caucasian, African American, and Hispanic) and age (middle school and high school).

Each videodisc contains one or two extended scenarios with branching story lines that allow end users to direct the course of a depicted teenage relationship by making choices for the on-screen couple. The viewers get to see what happens to the on-screen characters based on the viewers' choices. Thus the viewers get to experience vicariously the results of their choices. Good choices have positive outcomes; poor choices have negative outcomes, such as STDs and pregnancy. The on-screen characters model both effective and ineffective responses to potentially risky situations.

The theoretical framework for decision making is based on Fischhoff's analysis of the components of optimal decision making.[20] According to behavioral decision theory,[20] choice of a strategy for dealing with sexual situations is a function of (1) the options or strategies that adolescents recognize as available to them, (2) the consequences of each option they consider, (3) their evaluation of the likelihood and desirability of each possible consequence, and (4) the collation or processing of this information resulting in a chosen course of action.

Many adolescents tend to describe their sexual experiences as not involving any formal decisions; "It just happened" is a common refrain. We chose to emphasize the real decision points (even if they were not so recognized by most teenagers) by making them formal, obligatory decision points in our programs. (The program stops at such points and will not continue until the users make a choice.)

Even when key decision points are recognized, adolescents must be able to respond to those decision points in ways that they see as socially acceptable. If the adolescents do not see a socially acceptable way of declining participation in a risky sexual activity, they may well go ahead and engage in that activity even though they recognize a significant risk. This is entirely consistent with Fischhoff's model.[20] Thus our approach included providing socially acceptable alternatives for avoiding high-risk sexual situations.

The intent of this project was to provide materials that would extend and amplify the impact of traditional health, family life, and HIV educational programs. Few existing programs use the combination of highly interactive and compelling stories tailored to specific cultural groups that "The Choice Is Yours" programs are based upon.

METHOD

The program development and program evaluation aspects of this report are described separately below.

Program Development

Each of six programs was targeted at a specific population (three race/ethnicities: non-Hispanic Caucasian, African American, and Hispanic; at each of two age levels: middle school and high school). All six programs were developed in parallel using similar but independent activities. An element common to the development of all programs was the extensive use of focus groups (using adolescent focus group input for content and language, and adult focus group input for acceptability of adolescents' suggestions).

Subjects

More than 350 adolescent focus group subjects were recruited, with approximately equal numbers from each race/ethnicity, age level, and gender. Adolescent subjects primarily were recruited from high schools and middle schools in several northwestern cities, ranging from metropolitan (population > 500,000) to rural (population < 10,000). Most adolescent subjects were recruited through the use of flyers posted at schools or distributed in nearby areas where students frequented; the remainder of subjects were recruited by personal contacts with school personnel. Approximately 35 adults attended mixed-gender single-race/ethnicity focus groups. One group was held for each race/ethnicity. Subjects were representatives from three categories: (1) experts in adolescent sexuality (e.g., researchers, in-school clinic personnel, and teachers who work in this area), (b) potential purchasers or end users, and (c) community representatives who can address potential problems with subject matter and language (e.g., school board members, religious leaders, or parents).

All program development activities and statements of informed consent were reviewed by an institutional review board. All adolescent subjects who participated in the development activities provided signed assent and were required to have the signed informed consent of a parent or guardian. All adults who participated were required to provide written informed consent.

Activities

The development of each program began with four single-gender adolescent focus groups (two male and two female). Each group consisted of approximately 10 adolescents and was conducted by a same-sex, same-ethnicity leader to increase openness and

frankness in discussion. These focus groups provided information on what situations and decision points should be included in the program. Subjects were asked to list possible situations (both positive and negative), the appropriate strategies for dealing with the situations, and the consequences of those strategies. The adolescents were asked to enumerate and prioritize possible responses to these situations. The precise nature (e.g., any salient contextual variables) of the situations and responses, including descriptions of the language that would or should be used, was carefully noted.

Three mixed-gender single-race/ethnicity adult focus groups (one for each race/ethnicity addressed in the program series) were held, following the initial rounds of adolescent focus groups. These focus groups reviewed the information provided in the adolescent focus groups. The adults rated the completeness, appropriateness, and acceptability of program content suggested by the adolescents.

Based on the information collected in the focus groups, an overall design and logic (branching) flowchart (Figure 1) that included realistic and common situations relevant to risky sexual behavior was constructed for each program. The design included the list of situations chosen by the focus groups as being most important and realistic. The flowcharts show how the story line connects the various situations as well as the choices that determine which branches are available at each choice point. Rough scripts then were prepared from the designs and flowcharts. Each of the high school programs was designed as a pair of scenarios, while the middle-school programs each contained one extended scenario.

Next, the design, flowcharts, and rough scripts for each of the six programs were presented to two mixed-gender focus groups of the targeted adolescent subgroup. Each of the focus groups was presented with the situations to be portrayed in that program and how the story line would interconnect them. The groups were asked to judge the situations and connections for realism and completeness. Suggestions for changes in situations and language usage were reviewed with the script writers, and final scripts were prepared.

Each of the scenarios was cast with professional actors and actresses and produced by a professional video production company. In addition, print materials (e.g., teacher's guide and student handouts) to accompany the videodisc programs were produced. The curriculum guide provided teachers with complete information for using the programs, with suggestions for classroom discussions, use of handouts, role-playing guidelines, and supplementary activities.

Program Evaluation

These programs were evaluated in a randomized experiment to determine their efficacy in preventing HIV and STDs. Program effects were examined after completion of the videodisc program (i.e., pretest to posttest comparison) and again 1 month later (i.e., pretest to 30-day follow-up comparison).

Subjects

A total of 827 students participated in the study. The students were 50.1% female. The number of students in middle school was 327; there were 500 in high school. The schools participating in this study were located in Oregon and California and were in locales that

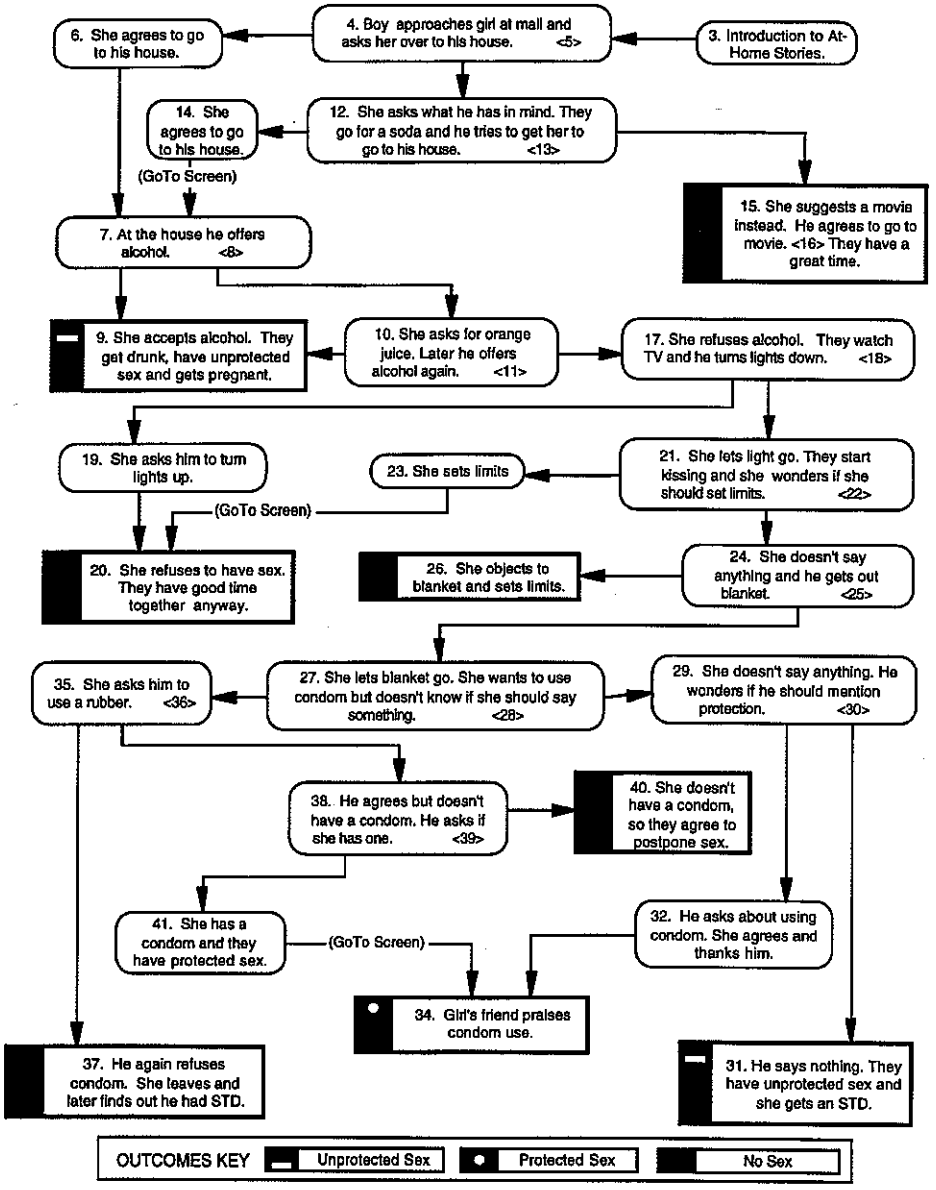

Figure 1. Example of scenario flowchart.
The story of LaTonya and Jordan: High school at-home flowchart.

ranged from urban (population > 500,000) to rural (population < 10,000). Schools were offered a set of the programs as an incentive to participate in the evaluation.

Forty-seven classrooms, which included a total of 19 teachers in nine participating schools, were randomized within teacher to treatment or to wait list control condition. (There were a few exceptions to the randomization process dictated by teacher scheduling

logistics. However, as noted below, there were no pretest differences between subjects in treatment and control conditions.) Of the classrooms, 44 were health classes and 3 were combined English-social studies classes that included HIV/STD content.

Although the classrooms were ethnically mixed, classrooms received the program that matched the majority ethnicity of the students. The factors in the design were developmental level (middle vs. high school), gender, and experimental condition. No attempt was made to systematically record the variety of other HIV/STD materials previously presented to participating classes (although teachers anecdotally reported many different approaches had been used), since the purpose of this evaluation was to determine the contribution of our programs in "real world" settings, where many other curricula are in use. Schools agreeing to participate in the study were offered a copy of the interactive program upon completion of the study.

Program Implementation

Project staff demonstrated the use of the program and the videodisc player to each teacher prior to classroom presentation and reviewed the teacher's guide. This minimal demonstration averaged about 20 minutes. Teachers then implemented the program in their classes. The fact that the teachers had never seen the program before and had little opportunity to familiarize themselves with the program or the material in the teacher's guide represented a "worst case" trial of program efficacy. Observers noted several features of program implementation, including whether teachers presented the program themselves or delegated use of the remote control to students, how decisions to take specific paths were noted (e.g., by student vote, by individual student choice, by the teacher, etc.), which specific paths were chosen, and which segments ultimately were viewed.

Assessment Procedures

Students in the treatment condition completed a questionnaire prior to the intervention, at the end of the intervention class period(s), and again 1 month later. Wait list control classes completed a set of questionnaires on the same days as the experimental condition subjects. Specifically, subjects in the wait list condition classes completed questionnaires before and after class period(s) of similar length (during class, other material was reviewed) and again 1 month later. Students in the wait list control condition received the intervention after completing the third assessment. All assessments were administered by project staff, not by the teacher, in order to enhance the veracity of students' responses.

Procedures were implemented to ensure confidentiality for subjects. Specifically, each questionnaire in a set of three questionnaires (i.e., pre-, post-, and follow-up) was marked with a student ID code number. A cover sheet with the student's name (without ID number) was attached to the set of questionnaires. After completing the pretest questionnaire, the subjects put the completed questionnaire in a locked box. The yet-to-be-completed questionnaires were then collected along with the cover sheet that included the subject's name. This allowed us to return the set of yet-to-be-completed questionnaires (with the same student ID number) to the same subject at posttest and follow-up sessions. At posttest the questionnaires were distributed by name and when completed were put in a locked box. Similarly, at follow-up, the last questionnaire was returned to the subject for

completion. After completion the subject put the questionnaire in the locked box and retained the cover sheet. This procedure allowed us to track the responses of each subject over time, and ensured that subject responses could not be traced to an individual subject.

Assessment Measures

Each program was intended to deliver four messages. First, the video material presented was expected to communicate that there is a large number of decisions made by adolescents before engaging in sexual activity and that each individual has the opportunity to shape the outcome of those decisions. Second, the program made it clear that the consequences of even one incident of unprotected sex can lead to contraction of an STD and/or pregnancy. Third, the program made the case for condom use and modeled effective and appropriate social interactions about condom use. Finally, the program content was designed to increase awareness of avoiding situations in which sexual activity might occur. The evaluation component examined the extent to which each program was effective in influencing these four measures.

All questionnaire items were constructed with a 5-point Likert-type response format. There was a total of 17 questionnaire items measuring outcome constructs. Decision making and STD/pregnancy risk were assessed with single items. The decision-making item asked, "Some teens feel that having sex ('going all the way') just happens. Others feel that having sex results from their own decisions. What do you think? How often does having sex result from a person's own decisions?" The item assessing level of perceived STD/pregnancy risk asked, "How likely is it that having unprotected sex (no condom used) one time will result in getting a sexually transmitted disease or pregnancy?"

Seven items assessed subject perspective on condoms, and seven items dealt with avoiding sex. One item on likelihood of having unprotected sex was included with a reversed scaling. This item was dropped due to concern that some students seemed to be confused by the wording reversal. The composite measures for avoiding sex (AVOID) and condom use (CONDOM) were based on a factor analysis described below.

RESULTS

In all but one classroom the program was presented by the teacher and the remote control remained in the hands of the teacher. (In one classroom a student was allowed to run the videodisc player.) As suggested in the teacher's guide, the decisions at branch points were made by students, not the teacher, in all classrooms. In the vast majority of cases the students either voted on which branch to view next or they engaged in open discussion, making arguments for why a specific branch should be chosen. Disagreements about which segment to view next were handled in a variety of ways. The teachers controlled the final decision because they held the remote control, but the decision usually was based on the majority opinion. Although there was variety in how the program actually was used, all classrooms allowed students to make the choices and all students viewed a minimum of 75% of the available segments. Most classes devoted a single class period to use of the program, with class periods ranging from 45 minutes to 90 minutes. No classrooms took more than two class periods to view the program.

Table 1. Factor Loadings, Communalities, and Percentage of Variance for Principal Components Extraction and Varimax Rotation of Questionnaire Items

	Factor 1	Factor 2	Communality
CONDOM items			
Likely would suggest	.84409	.19103	.74898
Likely would insist	.83299	.20736	.73687
Likely would use	.80824	.20516	.69535
Likely would think about	.80464	.15581	.67172
Likely agree to use	.73840	.16858	.57365
Confident could suggest	.79733	.08650	.64322
Confident could insist	.77712	.19823	.64322
AVOID sex items			
Likely suggest something else	.29808	.78369	.70303
Likely would abstain	−.03499	.67438	.45601
Likely would say no	.23468	.76276	.63687
Likely partner agree to something else	.25555	.73497	.60548
Confident could suggest something else	.28391	.76077	.65937
Confident could abstain	.01689	.73515	.54073
Confident could say no	.29325	.78245	.69822
Percentage of variance	46.8	17.6	

Factor Analyses to Create Composite Measures: CONDOM and AVOID

Principal components factor analysis with varimax rotation using the pretest data resulted in a clear two-factor solution for the 14 items assessing subjects' perceptions regarding condom issues and avoiding having sexual intercourse. One factor, the CONDOM factor, included seven items about suggesting, insisting on, using, and thinking about condoms. The other factor, the AVOID sex factor, involved seven items about avoiding sex by suggesting other activities, abstaining, saying no, and getting the partner to agree to something else. Composite variables constructed by averaging the seven items loading on each factor produced scales with high internal consistency. Cronbach's alpha for AVOID was .89 and for CONDOM was .92. The factor loadings are shown in Table 1.

Program Effects: Classroom as Unit of Analysis

In this study classroom was the unit of randomization; thus classroom is an appropriate unit of analysis. The following analyses determine if treatment classroom means on four outcome variables at posttest and 1-month follow-up were significantly different than the means of control classrooms (i.e., did the program have positive effects on the treatment classes).

Testing for Pretest Differences Between Treatment and Control

Analysis of variance was conducted comparing treatment and control subject classrooms at pretest on the four dependent measures across condition, gender, race, and school

Table 2. Classroom Analyses of Covariance

Variable	Posttest		30-Day Follow-Up	
	Covariate-Adjusted Means	ANCOVA *p* Value	Covariate-Adjusted Means	ANCOVA *p* Value
Decision		0.04		n.s.
Treatment	3.54		3.66	
Control	3.38		3.69	
STD risk		0.074		0.047
Treatment	3.67		3.70	
Control	3.55		3.50	
CONDOM		n.s.		0.025
Treatment	4.31		4.32	
Control	4.30		4.17	
AVOID		n.s.		0.028
Treatment	3.58		3.66	
Control	3.55		3.54	

level, which were entered as independent factors in the analysis. No significant differences were found between treatment and control subjects on any of the dependent factors. Further, no significant condition interactions were found with gender or school level. The pretest means for the decision and STD risk items were 3.49 ($SD = 0.51$) and 3.44 ($SD = 0.52$), respectively. The pretest means for the CONDOM and AVOID composites were 4.34 ($SD = 0.38$) and 3.34 ($SD = 0.62$), respectively. The covariate-adjusted means for the posttest and follow-up items on all four measures are shown in Table 2.

Efficacy of the Program: Treatment Versus Control

Analysis of covariance was conducted to determine if the treatment subject classrooms differed from controls after completing the program (i.e., posttest) and again 1 month later. There were four separate outcome measures: (1) the "decision" item, which assessed the belief that sex occurs as the result of personal decisions; (2) the "sex risk" item, which assessed the level of perceived risk of STD or pregnancy; (3) the CONDOM composite; and (4) the AVOID composite. The pretest score on each dependent measure served as the covariate in the respective analysis. Two-tailed analyses of covariance were conducted on all comparisons except the main effect of the intervention, which was hypothesized to improve each of the outcome measures in the treatment group. Experimental condition, gender, and age of subject (i.e., high school vs. middle school) were entered as independent variables in each analysis. To ensure that condition effects were independent of all other main effects in each analysis, the test of condition main effects was tested sequentially in the analysis, with condition entered after all other main effects. The interactions of condition with the other independent variables were of particular interest because significant interactions would indicate that program effects varied across levels of the other independent factors in the analysis.

Belief That Sex Occurs as Result of Personal Decision. The posttest analyses indicated that program effects were significant on the decision variable, $F(1, 83) = 3.15$, $p = 0.04$.

All two- and three-way interactions between condition and other factors were nonsignificant, indicating that program effects did not vary across levels of the other factors. Program effects were no longer significant at 1-month follow-up.

Perceived Risk of STD or Pregnancy. Program effects at posttest on subject perception of the level of risk associated with unprotected sex were significant, $F(1, 82) = 2.13$, $p = 0.074$. Program effects at 1-month follow-up were significant, $F(1, 80) = 2.89$, $p = 0.047$), but the three-way interaction of condition with age and gender was also significant, $F(1, 80) = 6.42$, $p = 0.013$. Small sample size subgroup analyses indicated that the program had significant effects on perceived risk for male middle-school students, $F(1, 14) = 11.62$, $p = 0.002$, and marginally significant effects for female high school students, $F(1, 24) = 2.13$, $p = 0.08$.

CONDOM Composite. While posttest analysis of covariance indicated that program effects were not significant on the CONDOM composite, program effects were significant at 1-month follow-up, $F(1, 80) = 3.93$, $p = 0.026$. However, there was also a significant interaction between condition and gender, $F(1, 80) = 4.16$, $p = 0.045$. Subgroup analyses found that there was a highly significant effect for males, $F(1, 39) = 6.12$, $p = 0.009$, with a covariate adjusted mean of 4.10 in the treatment classes and 3.81 in control classes. The program had no impact on the composite CONDOM variable for females due to restricted range. Females had very high scores on this variable (mean = 4.54 on a 5-point scale); there was little room for improvement.

AVOID Composite. Analyses of covariance indicated that while the program had no significant effects on the AVOID composite at posttest, there were significant effects at 1-month follow-up, $F(1, 80) = 3.77$, $p = 0.028$. No significant interactions between condition and the other independent variables were observed.

Summary of Class Effects

The analyses indicated significant program effects at posttest concerning the belief that sex is the result of one's own decisions and marginally significant effects on the level of perceived risk for unprotected sex. At 1-month follow-up the program had significant effects on three of the four measures: perceived risk of unprotected sex, the CONDOM composite, and the AVOID composite.

Program Effects: Subject as Unit of Analysis

Hierarchical Analytic Approach: Generalized Estimating Equations

Examining the effects of the program at the level of the individual is also an important research procedure. A major analytical issue common to school-based research is that when classroom is the unit of randomization, the observations for individuals within classroom will be positively correlated, reflecting common experiences, selection factors, or both. This positive intraclass correlation creates a component of variance attributable to the unit of randomization, which is confounded with variation due to treatment. Analyses of such data are done most frequently as if the data were obtained with subject

as the unit of randomization. Hence the standard assumption of independent and identically distributed observations is made. However, analyzing the data as a simple random sample ignores the potential interdependence within classrooms or clusters and can lead to inflated test statistics for estimated parameters and overall model fit. A hierarchical approach avoids these distortions. New analytic techniques that are more suited to the hierarchical data structure have recently emerged under the labels of hierarchical, or multilevel, models.[21-29] Muthén and Satorra[30] point out that such models take into account the correlated observations from heterogeneous populations with varying parameter values, gathered in hierarchical data.

The present report uses one such statistical procedure: generalized estimating equations (GEE). Zeger and Liang,[31] in their GEE approach, have extended the generalized linear modeling (GLM) framework to include correlated observations. Common correlational structures that can be used by GEE include independence, exchangeable, autoregressive, and unspecified. Zeger and Liang[31] have shown that it is possible, using GEE, to obtain consistent estimates of coefficients for mean structure models and good statistical tests in large samples, assuming the model is correct, even if the correlation matrix is misspecified. However, test statistics will be most powerful when the working correlation matrix closely approximates the true correlation matrix. Because it is possible in GEE analyses to obtain consistent estimates of coefficient even if the correlation structure is misspecified, the general analytic strategy is to view the analysis as a regression model with correlated residuals. The correlation between observations is therefore viewed as a nuisance parameter. A number of such applications of GEE can be found in the literature.[24,32,33] More detail on the methodology of GEE is also available.[24,31]

In the present study GEE methodology was employed to determine the effects of the intervention, gender, and age, factorially combined, controlling for pretest levels of the dependent measure and the hierarchical structure of the data. The correlation structure employed in these analyses was exchangeable, in which the correlation matrix is assumed to have one constant, off-diagonal element estimated from the data. In addition to the exchangeable correlation structure, the mean-variance relationship used is that of a Gaussian distribution, which implies that the mean is independent of the variance. We chose the Gaussian distribution because of the continuous and normal distributional qualities of the outcome variables.

Because only one outcome variable can be incorporated into any GEE model, separate sets of analyses were conducted for decision, STD risk, AVOID, and CONDOM. In each analysis, models were tested using backwards elimination and a one-tailed significance level of $p < .05$. Using backwards elimination, the least significant interaction term was dropped and the model was reestimated. This procedure continued until no more interaction terms could be eliminated. This process was then repeated for main effects that were not involved in any interactions that remained. The estimated regression coefficients and associated robust t statistics for each of the dependent measures are presented in Table 3.

Testing for Pretest Differences Between Treatment and Control

As shown in Table 3, at pretest the subjects in the treatment condition did not significantly differ from the subjects in the control condition on any of the four dependent measures.

Table 3. GEE Analyses Comparing Treatment to Control Subjects: Estimated Betas, Standard Errors, *t* Scores, and *p* Values

Variable	Effect	Estimated Beta	Robust *SE*	Robust *t*	*p* Value
Pretest comparisons					
Decision[a]	Condition	−.0845819	.1036652	−.8159147	n.s.
STD risk[b]	Condition	−.0362013	.1045876	−.3461335	n.s.
CONDOM[c]	Condition	−.0954747	.0646243	−1.4773816	n.s.
AVOID[d]	Condition	−.1207178	.0926498	−1.3029483	n.s.
Posttest comparisons					
Decision[a]	Condition	−.1582748	.0752402	−2.1035942	.02
STD risk[b]	Condition	−.2167485	.0879678	−2.4639531	.01
CONDOM[c]	Condition	−.1128800	.0621371	−1.8166295	.05
AVOID[d]	Condition	−.0670785	.0515625	−1.3009174	.10
1-month follow-up comparisons					
Decision[e]	Condition	.0161306	.0947985	.1701569	n.s.
STD risk[f]	Condition	−.1623811	.1157316	−1.4030838	.09
CONDOM[g]	Condition	−.1199215	.0772889	−1.5515999	.07
AVOID[h]	Condition	−.0864339	.0606052	−1.4261788	.08

a. $N_{observations} = 809$; $N_{clusters} = 47$.
b. $N_{observations} = 814$; $N_{clusters} = 46$.
c. $N_{observations} = 815$; $N_{clusters} = 47$.
d. $N_{observations} = 823$; $N_{clusters} = 47$.
e. $N_{observations} = 721$; $N_{clusters} = 45$.
f. $N_{observations} = 722$; $N_{clusters} = 45$.
g. $N_{observations} = 727$; $N_{clusters} = 45$.
h. $N_{observations} = 731$; $N_{clusters} = 45$.

Efficacy of the Program: Treatment Versus Control

The final models showed significant treatment effects at posttest concerning the belief that sex is result of own decisions, the perceived risk of unprotected sex, and the CONDOM composite; the AVOID composite showed a similar trend and approached significance ($p < .10$). At 1-month follow-up, treatment effects diminished. Three of the four measures showed trends that approached significance. No significant interactions for treatment condition, gender, or age were found for any of the models.

DISCUSSION

The results of this study indicate that the use of a brief interactive video-based intervention, tailored to the users' characteristics, was effective in changing attitudes, intentions, and self-efficacy related to sexual behaviors. The interactive nature of the stories, which allowed each class to take different paths through the interconnected story lines, not only captured the students' attention but permitted them to "take control of their own education." The degree to which empowering students (by allowing them to make

their own choices about how to use the interactive programs) increases the effectiveness of interventions such as this is in need of further investigation.

Despite the positive results observed, several important limitations to this study should be noted. Due to restrictions imposed by school districts, questions about actual sexual behaviors were not asked. The questions dealt only with intentions, attitudes, and self-efficacy. The sample of subjects was not a probability sample and was drawn only from Oregon and California schools.

Overall, the results provide evidence that the interactive videodisc program, "The Choice Is Yours," can effectively increase students' (1) belief that sex does not just happen but results from specific personal decisions, (2) recognition that unprotected sex is risky, (3) intention and self-efficacy on condom use, and (4) intention and self-efficacy on avoidance of sex. The fact that there were significant program effects on three of the four classroom measures at 1-month follow-up was particularly encouraging given the limited classroom time dedicated to these issues.

CONCLUSION

Based on the reports of participating teachers and the classroom observers, two program features were of particular importance: interactivity and the matching of video materials to the students' race/ethnicity. The use of a branching story line proved to compel student attention and was quite popular with students. The use of screens presenting discussion items at key points in the program proved to be an effective way to prompt student participation in discussions, even when teachers were not entirely comfortable talking about sexual behaviors. Although students, by their own choice, ended up seeing almost every possible alternative, the fact that they got to "choose" what to see at each point in the program appeared to increase their attention and enthusiasm. Despite some variation in implementation, the medium of the interactive videodisc made it relatively easy for teachers to effectively present material on sexual decision making.

The interest level (and ultimately effectiveness) also appears to have been related in large part to the use of culturally tailored materials. Although there was great similarity in the scenarios across all programs, the language, clothing, and interpersonal behaviors were clearly different for each race/ethnicity. Many anecdotal reports were received that commented on the appropriateness of the video materials. Although almost all classrooms had students from more than one type of race/ethnicity, most classrooms had a very significant majority of one race/ethnicity. Both students and teachers expressed satisfaction at having a program that matched the majority of students, providing greater apparent program relevance to their personal situations.

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