An Evaluation of the Experiences of Rural MSM Who Accessed an Online HIV/AIDS Health Promotion Intervention

Mark Williams, PhD,
professor of behavioral sciences at the University of Texas School of Public Health in Houston, Texas.

Anne Bowen, PhD, and
professor of psychology at the University of Wyoming Department of Psychology in Laramie, Wyoming.

Sue Ei, PhD
a postdoctoral fellow in clinical psychologist at Geisinger Medical Center in Danville, Pennsylvania.

Abstract

The purpose of this study was to assess rural MSM's satisfaction with an Internet-delivered HIV/AIDS intervention. Objectives were to evaluate if completion rates varied by characteristics, if completion varied by computer issues, if satisfaction changed from first to last modules, and if satisfaction was associated with module order. Data were collected from 300 rural MSM. Results showed few differences between men who completed the intervention and those who dropped out. Completion was associated with income, accessing the intervention at home, time to load screens, and finding navigation easy. For those completing the intervention, interest in and perceived usefulness of the information increased from first to the last module. Module order was associated with the knowledge module. Interest in the module was greatest if it was encountered last. Results indicate that rural MSM are willing to enroll in and complete an Internet-delivered HIV/AIDS risk reduction intervention.

Keywords

HIV/AIDS health promotion; Internet interventions; men who have sex with men; health

Two-thirds of Americans have access to the Internet, and the majority of these have conducted an online search for health-related information (Fox & Fallows, 2003). The willingness of Americans to use the Internet as a source of health information suggests that it might be a platform for widely delivering health promotion interventions. Online health promotion interventions have been developed to improve nutrition (Oenema, Frans, & Brug, 2001), prevent obesity and diabetes (Glasgow, Boles, McKay, Feil, & Barrera, 2003; McKay, King, Eaking, Seeley, & Glasgow, 2001; McCoy, Couch, Duncan, & Lynch, 2005), deal with depression (Andersson et al., 2005), and treat mental disorders such as alcohol abuse (Saitz et al., 2004), panic disorder (Carlbring et al., 2001; Carlbring et al., 2005), headache (Devineni & Blanchard, 2005), and psychological distress (Andersson et al., 2002). Recently, scientists have been working to develop online health promotion

Correspondence should be addressed to Dr. Mark Williams, School of Public Health, University of Texas Health Science Center at Houston, 7000 Fannin Street, Houston, Texas 77030, Mark.L.Williams@uth.tmc.edu.

interventions designed to prevent HIV/AIDS (Bowen, Horvath, & Williams, 2006; Pequegnat et al., 2006). Internet-based health promotion interventions have a number of advantages, especially for some population groups. Online interventions can be extremely convenient for the user as they are accessible from anywhere there is a computer connected to the World Wide Web (Bowen, 2005). A user can access an intervention whenever he or she is ready to do so and as often as he or she likes (Binik, 2001; Mustanski, 2001). A particularly attractive feature of Internet-based interventions for maladies such as HIV/AIDS is that a user can access an intervention in private, thus reducing any fear of embarrassment or discovery a user might feel (Kling, Lee, Teich, & Frankel, 1999; Williams, Bowen, & Horvath, 2005).

Accessibility of online health promotion interventions may be particularly relevant for men who have sex with men (MSM) living in rural areas who are at risk for HIV/AIDS (Williams at al., 2005). Rural MSM are geographically isolated and socially cut off from supportive gay communities, which tend to be in large urban areas, and in which most HIV/AIDS interventions targeting MSM are available. Rural MSM, especially those who seldom travel to urban areas, may be unaware that intervention materials exist. Furthermore, materials designed to address the concerns of urban MSM may not be relevant to MSM living in rural areas. A recent study conducted by Bowen et al. (2006) suggests that the Internet may be an effective venue for delivering HIV/AIDS information and health promotion interventions to rural MSM. This study found that rural MSM participating in an online risk reduction intervention significantly increased HIV-related knowledge, positive condom use outcome expectancies, and condom use self-efficacy across time and when compared to a wait-listed group.

Although the results of the Bowen et al. (2006) study are encouraging, the study did not address how likely it was that rural MSM who began the study's intervention would complete it or how satisfied they were with the experience. Such an assessment is critically important for online-delivered risk reduction and health promotion interventions. People who use the Internet often have specific reasons for being online and quickly navigate away from sites that neither match their interests nor somehow engage their attention (Pequegnat et al., 2006). If online HIV/AIDS health promotion interventions are to be successful, they must be sufficiently engaging and entertaining to attract and keep users' attentions. The Wyoming Rural AIDS Prevention Project is one of the first Internet interventions developed to engage MSM residing in rural areas in HIV risk reduction activities. The purpose of this study was to assess how participants in an Internet HIV/AIDS health promotion intervention perceived the experience. The intervention, the HOPE Project, consisted of three modules that addressed HIV/AIDS knowledge, motivation, and strategies to reduce risk behaviors. Specific objectives of the study were to evaluate if completion of the intervention varied by participant characteristics, if completion of the intervention varied by computer issues or satisfaction with delivery of the intervention, if there were changes in measures of satisfaction from the first to the last modules, and if measures of satisfaction were associated with the order in which intervention modules were encountered. Because it is easy to cease participating in an Internet intervention by navigating away from it, it was reasoned that in addition to other measures, completion of the online intervention indicates satisfaction with it.

METHOD

Procedures

Prospective participants gained access to the HOPE Project by clicking a banner ad posted on a popular MSM dating Web site. Clicking on the banner took men to the HOPE Project homepage. After reading a brief description of the project and the evaluation study, those

who were interested were screened for eligibility by completing a brief questionnaire. Eligible men were automatically taken to consent pages that provided information about intervention activities, data collection procedures, and study risks and benefits. Men who chose not to participate clicked a button and were automatically routed to a "thank you" page. Men choosing to participate clicked a button that took them to a "signature page." Choosing a study username and password signified consent.

After providing consent, participants completed a baseline questionnaire and were randomly assigned to one of three intervention module orders. Module orders are shown in Figure 1. The modules were accessed by entering the username and password. Participants had 14 days to complete both sessions of a module and the post-module assessment. Those who failed to do so within 14 days were dropped from the study.

Participants

The study was designed for sexually active MSM residing in rural areas. To be eligible to participate in the study, participants were required to be male, 18 years of age or older, have had sex with another man in the past year, and reside in a rural area at least an hour's drive from a major urban area. To confirm rural residency, an algorithm was used to compute the distance from an individual's reported town of residence to the nearest metropolitan area. Rural was defined as an area or town with a population of less than 75,000 (Bowen, 2005).

The intervention

The HOPE Project intervention was composed of three modules, each consisting of two 20-minute sessions. Each module was designed to address an element of the information, motivation, and behavior model (Fisher & Fisher, 1993). The knowledge (information) module is described in detail elsewhere (Bowen et al., 2006). Briefly, the knowledge module presented HIV-related facts germane to rural MSM using a conversation between an expert, an HIV-positive gay man, and a second gay man, representing the participant, who has recently had high-risk sex as the intervention delivery format. The knowledge module primarily dealt with topics related to prevention of HIV infection during sex and living with HIV after infection which formative research had shown to be of interest to rural MSM. Dialogue was interspersed with interactive activities and "tell me more" buttons that, if clicked, provided access to Web links for sites providing more information.

The motivation module used a discussion between five gay male friends, one of whom represented the participant, as the format for delivering intervention content. The module focused on motivating participants to reduce their risk of HIV infection by helping them clarify long-term life goals, identify excuses for not using condoms, and assess ways to deal with their excuses in relation to their life goals. The module also used interactive dialogue to help participants identify personal situations associated with past episodes of unsafe sex and choose approaches for convincing partners to use condoms. Printable feedback was provided at the end of the module summarizing participants' responses to interactive components.

The behavior module also used an interactive format and was presented as a group discussion among five friends, with one of the friends again playing the role of the participant. The module was intended to help men adopt behaviors that would reduce their risk of engaging in risky sexual behaviors with partners met in a bar or on the Internet. Formative research had shown that rural MSM most often frequent these two venues when looking for sex partners. Interactive components of the module dealt with indentifying personal situations in each setting associated with past episodes of unsafe sex after meeting a partner and identifying behaviors to increase safer sex with partners. Printable sheets were provided as a summary of the participant's choices made during interactive activities.

Measures

Sociodemographic and computer-related data were collected before random assignment to the modules. Other data were collected after completion of each module.

Data collected on the sociodemographic characteristics of participants were age in years (recoded to 10-year intervals), race and ethnicity, marital status (single, married, having a male partner, and widowed, separated or divorced), sexual orientation (heterosexual, bisexual, and homosexual), education (less than a high school education, a high school education, and some college), student status (full-time student, part-time student, and nonstudent), and annual income (l < $15,000, $15,000 to $24,999, $25,000 to $49,999, and ≥ $50,000).

Participant satisfaction was assessed using a number of measures. Completion of the intervention measured as completing all three intervention modules. Failure to complete the intervention, or dropping out of the study, was measured as completing only one intervention module. The variable related to Internet access or one's computer were measured by modem speed (dial up or high speed), location of the computer (at home or in a public place), and time of day the intervention was initially visited (6:00 a.m. to 12:00 p.m., 12:00 p.m. to 6:00 p.m., 6:00 p.m. to 12:00 a.m., and 12:00 a.m. to 6:00 a.m.). Participants were asked to assess intervention delivery by time to load screens ("took too long" or "time was acceptable") and ease of navigating within modules (5-point scale that ranged from *very difficult* to *very easy*).

Factors related to the format used to deliver the content of an intervention module were assessed by participants' ratings of the pictures and stories used in a module. Assessments were recorded using bivariate items, "get rid of the pictures" or 'keep the pictures" and "no story, just information" or "use the story." Another variable related to intervention delivery was time to complete module activities ("took too long" and "time was acceptable").

Personal variables measured were interest in module activities (low, moderate, high) and perceived usefulness of the module content (low, moderate, high). Participants were also asked if they would participate in the module again (yes or no) and if they would recommend the intervention module to a friend (yes or no).

Analysis

Four analyses were conducted. First, baseline data were examined to determine if there were differences in characteristics between participants who completed all intervention modules and those who completed only the first module. Second, data were examined to determine if there were differences in computer access and satisfaction between those completing all modules and participants dropping out after completing one module. Third, for those completing all modules, data were analyzed to determine if there were significant changes in measures after completing the first module and after completing the last modules (all three modules). Finally, the order in which participants encountered the intervention modules was assessed to determine if interest in and perception of module usefulness varied by the order in which modules were encountered. Comparisons were made between those who encountered a module first compared to the group encountering the module last. Sample sizes vary by comparison.

Comparisons between groups were made using chi-square, *t* tests, and Mann Whitney test of proportions where appropriate. The significance level for all comparisons was set at *p* < .05. For those measures showing significant differences, odds ratios and 95% confidence intervals were calculated to aid in interpreting the results.

RESULTS

Sample

Characteristics of the 300 men enrolled in the study are shown in Table 1. About two-thirds were 29 years or younger, and almost three-quarters were White and single. Approximately four-fifths self-identified as gay. More than half had attended college and half were nonstudents at the time they participated. More than a third had incomes of $15,000 or less per year.

Completion by sociodemographic characteristics

Of the 300 men enrolled in the study, 252 (84%) completed the first and second modules, and 219 (73%) completed all three modules of the intervention. There were no significant differences in the sociodemographic characteristics of participants who completed all three modules compared to those who completed only the first module, except by income ($\chi^2 =$ 5.73, $p = .017$). Half of those who dropped out after the first module earned $15,000 or less, compared to a third of those who completed all three modules. The odds of completing all three modules was 1.88 (CI = 1.11 – 3.14) greater if a participant earned more than $15,000 per year.

Completion, computer issues, and satisfaction with intervention delivery

As shown in Table 2, almost 80% of the participants enrolling in the intervention had high-speed internet connections, and 9 out of 10 accessed the Web site from home. More than half visited the intervention website after 6:00 p.m., although about a fifth accessed the program in the morning or the afternoon respectively.

Men who completed the intervention were significantly different from those who dropped out of the intervention after completing one module on one computer-related variable, as shown in Table 2. Those who dropped out were significantly more likely to have accessed the intervention using a computer at home ($\chi^2 = 4.18$, $p = .040$). The odds of dropping out were 4.24 times greater if a participant was using a home computer compared to a participant using a computer in a public place, although the 95% confidence intervals were borderline (CI = .955 – 18.82).

Almost half of the men who accessed the intervention found that the modules were very easy to navigate. Half reported that the modules were interesting, and nearly three quarters said that the information presented in the modules was useful. The majority also reported that they would be willing to participate in the intervention again.

Completion of the intervention was significantly associated with only ease of navigation in the modules ($\chi^2 = 8.10$, $p = .017$). The odds of dropping out were 2.28 times greater (CI = 1.28 – 4.08) if a participant found the module very easy to navigate compared to those who found them difficult.

Change from Module 1 to Module 3

As shown in Table 3, for participants completing all three modules, there was no change in satisfaction with the time it took to load new screens, timing of the text, use of pictures, or the story lines used to illustrate modules. Likewise, there was no change in the number of participants who said they would participate in a module again or who would recommend participating to a friend.

There were significant differences after completing the first and the third modules in the proportions of individuals who found module activities interesting and useful. The

proportion who found the modules very interesting increased from 52% after completing the first module to 63% after completing all three modules. Participants who found the information very useful increased from 70% after the first module to 79% after completing the last module. The increase in proportions was reflected in mean evaluation scores. Interest increased from 4.20 after the first module to 4.38 after the second module ($p < .013$). Usefulness scores increased from 4.58 to 4.67 ($p < .044$).

Module order

Of 219 participants who completed all three modules of the intervention, 71 encountered the knowledge module first, 74 the motivation module, and 74 the behavior module. The order in which participants encountered a module made no difference with regard to the modules' interest or usefulness, except for those enrolled in the knowledge module. As shown in Table 4, of those enrolled in the knowledge module first, about half found the module very interesting compared to three quarters who participated in the knowledge module last ($\chi^2 = 8.01$, $p = .018$).

DISCUSSION

The Wyoming Rural AIDS Prevention Project is one of the first Internet interventions developed to provide rural MSM with HIV risk reduction strategies. The goal of this study was to examine the overall satisfaction with the interventions and to identify factors that affect satisfaction.

The majority of participants who completed the first intervention module returned to complete the entire intervention. The demographic characteristics most associated with dropping out of the intervention after one module was earning less than $15,000 per year. In general, men in this income category were college students or men with less than a high school diploma who were working full time. For the latter group, comprehension should not have presented a problem, as module text was at a 3rd-grade level. For these men, a lack of interest in reading may have presented a barrier to completing the intervention. The intervention may simply have felt too academic. College students may have also found the intervention insufficiently interesting for a related deficiency. College students may have advanced computer skills and experience with more advanced Internet Web sites. For these men, the intervention may not have been sufficiently sophisticated to be challenging or interesting. Increasing the sophistication of the intervention, including more interactive activities that rely on audio rather than text, may lead to greater retention of both types of men.

Finding the intervention very easy to navigate and accessing the intervention at home were also associated with dropping out of the intervention. Ease of navigation may contribute to dropping out in a couple of ways. First, participants may not have found the intervention sufficiently challenging to hold their interest and have expected a higher level of sophistication than was presented. It may also be that men who found the intervention easy to navigate also tend to "surf" rapidly through many sites. The intervention was designed so that men would spend a lengthy, in Internet terms, amount to time participating in intervention modules. Rapids surfers may have found the time demanded of them to be too great. Similarly, men who accessed the intervention from home may have been interested in other things, such as dating or chatting with friends. When the intervention site did not match their desired agenda, the time required to complete the intervention may have been too great. Alternatively, those accessing the Internet in public places, like schools or libraries, are usually searching for specific types of information. Men who accessed the intervention in a public setting may have been searching for HIV/AIDS-related information, and the HOPE Project met their agenda. Once interested, these men may have been more

motivated to complete the intervention. Although men who accessed the intervention using dial-up connections were no more likely to drop out than men who used high speed connections, they did report that the modules took too long to load. This combination of findings supports the need for further research on the interaction between program sophistication and time to load that may affect satisfaction.

Overall, the majority of participants found the information presented in the intervention interesting and useful and would recommend it to their friends. Additionally, for men who completed all three modules, the proportions who found the content interesting and useful increased. It is interesting to note that the proportion of men who found the knowledge module interesting was higher for those who participated in it last. This may be because MSM, especially younger men, are overexposed to facts about HIV and the risks of infection. Men who began the intervention with the knowledge module may have found it less interesting because it appeared to them to be just more of the same information they had encountered elsewhere. On the other hand, men who first participated in the motivation and behavior modules may have received sufficiently new and different information that was also sufficiently salient to important areas of their lives that when they finally participated in the knowledge module, they were more interested in learning basic facts about HIV. The question of ordering information needs more study, but the findings do suggest that MSMs' satisfaction with an Internet intervention and willingness to learn basic HIV prevention facts may increase if they first experience prevention activities related to their life goals and sexual behaviors.

The overall external validity of these findings is limited in terms of generalizability across populations or time. Participants were not randomly generated from a list of all possible persons who met study eligibility criteria. Although this limitation is not uncommon for studies involving hidden and elusive populations, the representativeness of the sample in terms of the population of rural MSM is unknown. Furthermore, the findings cannot be generalized to urban MSM or non-MSM population groups. Given the rapid pace of the evolution of Internet technology, and user sophistication, the generalizability of the findings across time may be limited.

Internal validity of this study and Internet studies in general is difficult to assess. An advantage of the Internet is that participants can respond when and where they like, but this advantage also raises questions as to the veracity of participants' identities and responses. Although there is little reason to assume that participants in this study falsely claimed to be a man who has sex with men living in a rural area, it is possible that some participants may have falsely claimed to possess characteristics that matched study criteria. There is also little reason to believe that participants falsely responded to any of the questionnaire items, as there was little incentive for them to do so. Nevertheless, some participants, for unknown reasons, may have exaggerated their responses, have not taken care in responding, or provided false answers.

Despite these limitations, the finding of this study support the belief that online interventions could be an important means for providing needed HIV knowledge and risk reduction skills training to MSM residing in rural areas. Many rural MSM are geographically and socially isolated with few opportunities to participate in HIV risk reduction interventions (Williams et al., 2005). Even if rural MSM travel to urban areas to participate in interventions, many may find that the content does not address issues of concern to them. The circumstances encountered by rural MSM on a day-to-day basis vary greatly from those faced by MSM in urban areas. Applying existing interventions in rural areas also holds little promise. Many interventions formats, such as face-to-face group encounters, are inappropriate in rural areas, where most MSM live hidden lives. Even if interventions could be adapted for delivery in a

rural area, the number of rural MSM living within reasonable travel time to the program may be too small for a program to be cost-effective. Internet-delivered HIV risk reduction interventions targeting rural MSM may provide a way to overcome these difficulties, but more research on the effectiveness and efficacy of online health promotion interventions needs to be conducted.

Acknowledgments

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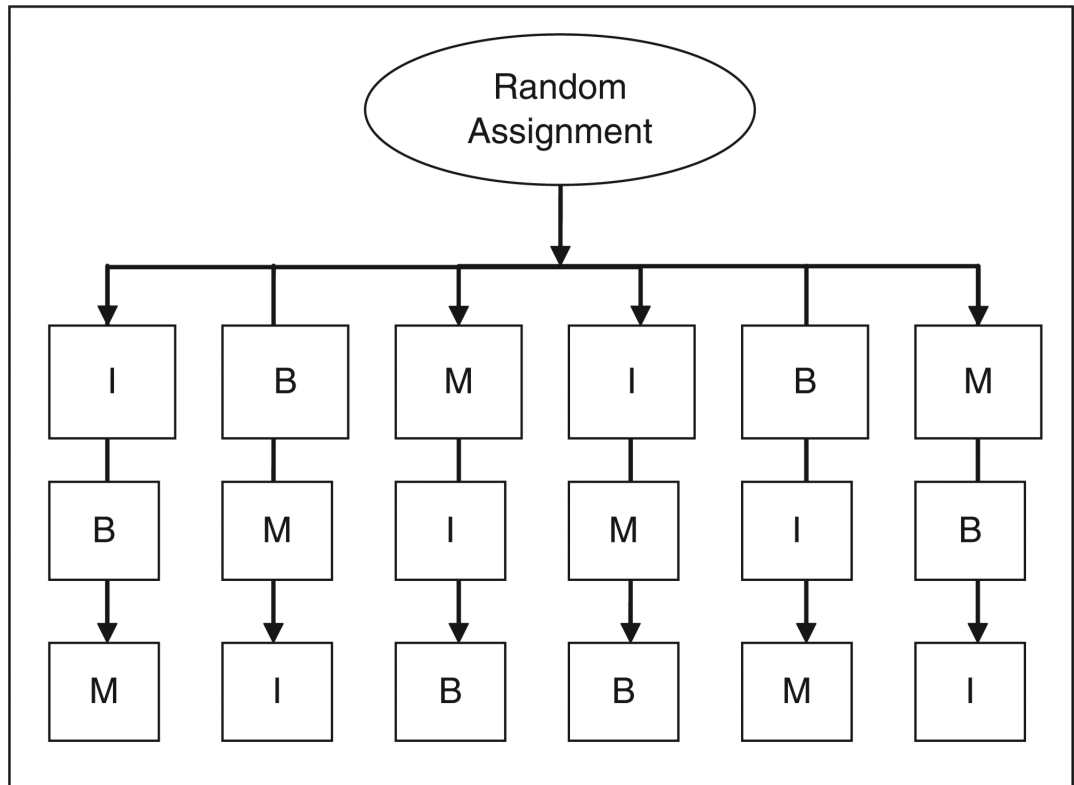
FIGURE 1.
The HOPE Project Intervention Showing Random Assignment to the Information (I), Motivation (M), and Behavior (B) Modules

TABLE 1

Sample Characteristics

	Sample n = 300	*Completed* n = 219	*Dropped Out* n = 81
Age			
18 to 29	67%	66%	66%
30 to 39	18%	21%	18%
> 40	15%	14%	16%
Race and ethnicity			
White	77%	77%	84%
African American	3%	2%	3%
Hispanic	10%	10%	10%
Asian	3%	8%	3%
Native American	5%	4%	1%
Marital status			
Single, never married	77%	75%	85%
Married, female partner	4%	4%	5%
Male partner	13%	15%	5%
Widowed, separated, or divorced	6%	6%	5%
Sexual orientation			
Heterosexual or bisexual	15%	15%	13%
Homosexual	85%	85%	86%
Education			
< High school	31%	4%	3%
High school	12%	15%	17%
College	57%	82%	80%
Student			
Full time	31%	31%	33%
Part time	12%	13%	12%
Nonstudent	57%	57%	54%
Income			
< $15,000	39%	34% [*]	49% [*]
$15,000 to $24,999	25%	28% [*]	14% [*]
$25,000 to $49,999	27%	27% [*]	26% [*]
≥ $50,000	9%	11% [*]	11% [*]

[*] $p < .05$.

TABLE 2

Internet Access, Intervention Delivery, and Satisfaction With the Intervention

	Sample n = 300	*Completed* n = 219	*Dropped Out* n = 81
Modem			
Dial up	21%	22%	21%
High speed	79%	78%	79%
Computer location			
Home	87%	83% [*]	95% [*]
Public place	13%	17% [*]	5% [*]
Time of day participating			
Morning (6:00 a.m. to 12:00 p.m.)	21%	23%	16%
Afternoon (12:00 p.m. to 6:00 p.m.)	21%	19%	25%
Evening (6:00 p.m. to 12:00 a.m.)	42%	41%	46%
Late night (12:00 a.m. to 6:00 a.m.)	16%	17%	14%
First module assignment			
Knowledge	36%	38%	32%
Context	32%	29%	41%
Partner	31%	33%	27%
Time to load screens			
Too long	25%	25%	25%
Just right	75%	75%	75%
Time to complete modules			
Too long	18%	19%	18%
Just right	82%	81%	82%
Ease of navigating			
Difficult	6%	7% [*]	5% [*]
Easy	45%	49% [*]	31% [*]
Very easy	49%	44% [*]	64% [*]
Interest in modules			
Not interesting	21%	20%	25%
Interesting	31%	32%	26%
Very interesting	48%	48%	48%
Usefulness of information			
Not useful	8%	8%	8%
Useful	21%	15%	23%
Very useful	70%	77%	68%
Would participate again			
No	17%	16%	20%
Yes	83%	84%	80%

[*]
$p < .05$.

TABLE 3

Change From 1st Module to 3rd Module ($n = 219$)

	1st Module	3rd Module
Time to load screens		
Too long	25%	27%
Just right	75%	73%
Timing of the text		
Too long	25%	27%
Just right	75%	73%
Pictures		
Get rid of them	14%	18%
2	20%	15%
3	22%	20%
4	19%	19%
Keep them	25%	28%
Story		
No story, just facts	17%	5%
2	16%	21%
3	23%	20%
4	22%	21%
Use a story	21%	30%
Interest in modules		
Not interesting	17% [*]	15% [*]
Interesting	31% [*]	22% [*]
Very interesting	52% [*]	63% [*]
Usefulness of information		
Not useful	8% [*]	1% [*]
Useful	22% [*]	12% [*]
Very useful	70% [*]	79% [*]
Participate again	83%	87%
Recommend to a friend	94%	97%

[*]
$p < .05$

TABLE 4

Interest in the Intervention and Evaluation of Its Usefulness by the Order in Which the Modules Were Encountered

	Knowledge n = 154		Motivation n = 146		Behavior n = 138	
	1st	3rd	1st	3rd	1st	3rd
Interesting						
Not at all	21%	9%	20%	18%	17%	20%
Interesting	28%	18%	35%	27%	36%	30%
Very interesting	52%	73%	46%	56%	47%	50%
Useful						
Not at all	5%	9%	7%	8%	17%	10%
Useful	24%	13%	25%	15%	20%	11%
Very useful	71%	80%	69%	77%	64%	80%