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Human subjects participated in this study after giving their free and informed consent. This research has been conducted in compliance with all applicable Federal Regulations governing the Protection of Human Subjects in Research.

SUMMARY

Problem

Military personnel may be at especially high risk for HIV and sexually transmitted diseases (STDs) due to their demographic characteristics and overseas assignments. Although behavioral interventions have been shown to reduce rates of unprotected sexual intercourse in a variety of populations, behavioral interventions to prevent HIV/STDs in U.S. military populations have been lacking.

Objective

The objective of this study was to implement a behavioral intervention known as the STD/HIV Intervention Program (SHIP) in a sample of Marine Security Guards (MSGs) and to determine the effectiveness of this intervention.

Approach

Marines attending MSG school in Quantico, VA, were exposed to a 6-hr intervention to prevent STDs/HIV. Participants were assessed prior to and after the intervention on measures of knowledge and 9 psychosocial scales (pretests and posttests). The psychosocial scales measured attitudes toward condoms, social norms, behavioral intentions for safe sex, and other constructs that would theoretically be expected to be associated with safe sex. Cross-sectional correlates of self-reported condom use were also examined.

Results

Comparisons of pretest and posttest scores revealed that scores on the STD/HIV knowledge measure were significantly higher after the intervention. Significant differences were also found on Social Norms, Behavioral Intentions, Attitudes Toward Condoms, and Self-Efficacy/Impulse Control. On Social Norms and Behavioral Intentions, the differences were as expected: participants perceived greater social norms for condom use and stronger intentions to practice safe sex after the intervention than before. On Attitudes Toward Condoms and Self-Efficacy/Impulse Control, the differences were in the direction opposite of our hypotheses; participants had more negative condom attitudes and lower self-efficacy after the intervention. Many of the psychosocial measures (e.g., Behavioral Intentions and Attitudes Toward Condoms) had substantial correlations with self-reported condom use during the past year.

Conclusions

SHIP produced a significant increase in the Marines' knowledge of STDs/HIV. In addition, the intervention led to stronger perceived social norms for condom use and stronger behavioral intentions to engage in safe sex. However, the intervention also produced some unanticipated effects (e.g., attitudes toward condoms became less positive).

The results of the 1-year follow-up investigation will allow us to determine the impact of the intervention on sexual behavior.

Introduction

HIV/AIDS is undoubtedly the most important infectious disease epidemic of the late twentieth century. As of 1997, the Centers for Disease Control and Prevention estimated that about 270,000 people in the United States had AIDS (Centers for Disease Control and Prevention, 1998). Because HIV/AIDS and other sexually transmitted diseases (STDs) are transmitted through risky sexual behaviors, they can be prevented through appropriate behavioral changes. People can learn to avoid the behaviors that place them at risk for HIV and STDs or to engage in safer variants of these behaviors (e.g., to use condoms). Because there is no vaccine or cure for HIV at this time, behavioral change is currently the primary means of preventing HIV/AIDS. Consequently, there is a clear need for research on the effectiveness of behavioral interventions to prevent HIV and STDs in a wide variety of populations.

Behavioral interventions have been shown to reduce rates of unprotected sexual intercourse in a variety of populations (Jemmott, Jemmott, & Fong, 1992; Kelly, St. Lawrence, Hood, & Brasfield, 1989; Kelly et al., 1994; Peterson et al., 1996; Rotheram-Borus, Koopman, Haignere, & Davies, 1991; St. Lawrence et al., 1995). A growing body of scientific evidence indicates that although not all interventions have an effect on behavior, changes in risky behavior can occur as a result of well-designed interventions (see reviews by Academy for Educational Development, 1996; Holtgrave et al., 1995; Oakley, Fullerton, & Holland, 1995). A meta-analysis demonstrated that cognitive-behavioral HIV risk reduction interventions significantly reduce HIV risk behaviors with small to moderate effect sizes (Kalichman, Carey, & Johnson, 1996). Moreover, a National Institutes of Health Consensus Panel concluded that behavioral interventions to reduce HIV/AIDS are effective and should be widely disseminated (National Institutes of Health, 1997).

Several authors have noted that HIV interventions grounded in psychological theory are generally more effective than interventions lacking a theoretical basis (Fisher & Fisher, 1992; Wingood & DiClemente, 1996). A dominant theory in the HIV risk behavior literature is the Information-Motivation-Behavioral Skills (IMB) model (Fisher & Fisher, 1992; Fisher, Fisher, Williams, & Mallow, 1994). Developed specifically to explain HIV risk behavior, this model of behavior change assumes that there are three main determinants of risk reduction: (1) information, (2) motivation, and (3) behavioral skills. The model states that for individuals to change their behavior, they need information, motivation, and behavioral skills to help facilitate the change. *Information* refers to basic knowledge about STDs/HIV transmission and prevention. *Motivation* refers to personal attitudes about preventive behaviors (e.g, condom use), as well as perceived normative support for such behaviors. *Behavioral skills* for preventing STDs/HIV include social skills, appropriate assertiveness, and communication skills.

A review by Fisher and Fisher (1992) of behavioral interventions to prevent HIV concluded that interventions that are conceptually based and population-specific were the most likely to have a positive impact on AIDS-preventive behavior. A number of other researchers in the HIV prevention arena have also emphasized that to be effective, behavioral interventions need to be population-specific (Becker, Rankin, & Rickel, 1998;

Oakley et al., 1995). Thus, there seems to be fairly widespread agreement in the HIV prevention literature that behavioral interventions should be tailored to the specific population or audience for which they are intended.

Although a substantial number of studies have been conducted to implement and evaluate behavioral interventions to prevent HIV, these studies have focused on civilian rather than military populations. Research evaluating HIV behavioral interventions among U.S. military personnel has been lacking. Unsafe sex among military personnel is of particular concern because military personnel may be at especially high risk for STDs/HIV due to their demographic characteristics (e.g., young age and predominantly male gender), their frequent deployments, and their assignments to foreign countries with high rates of HIV. Previous studies of deployed military personnel have documented a number of factors that contribute to STD acquisition, including sexual contact with commercial sex workers, abuse of alcohol, and inconsistent use of condoms (Malone, Hyams, Hawkins, Sharp, & Daniell, 1993). Clearly, there is a need to develop and evaluate STD/HIV prevention programs designed specifically for U.S. military populations.

Since 1994, researchers at the Naval Health Research Center (NHRC), San Diego, CA, have conducted research designed to prevent STDs and HIV/AIDS among military personnel. In the first NHRC project (Boyer et al., 1997a), a behavioral intervention called the STD/HIV Intervention Program (SHIP) was developed and tested on a large sample of enlisted Marines assigned to ships on a Western Pacific deployment. The content and format of the intervention were based on the IMB model (Fisher & Fisher, 1992; Fisher et al., 1994). This 8-hr intervention was designed to increase the Marines' level of knowledge about STDs/HIV, to increase their motivation to avoid STDs/HIV, and to enhance their motivation to engage in safer behaviors. The program used a variety of media (e.g., videos, slides) to present information and included small group discussions and other interactive group activities.

The evaluation of this initial version of SHIP (Boyer et al., 1997a) indicated that it was successful in leading to a significant reduction in self-reported risky sexual behaviors and alcohol use in the intervention group (Marines who were exposed to SHIP) compared with the control group (similar Marines who were not exposed to SHIP). Based on these results, it was determined that SHIP should be transitioned to another military population, to Marine Security Guards (MSGs).

MSGs are assigned to guard and protect U.S. embassies located all over the world, including Third World countries. Currently, about 1,200 MSGs are stationed at more than 150 posts around the world. MSGs are a potentially high-risk group for the acquisition of STDs and HIV, since they tend to be young (under age 30 years of age), male, and are frequently stationed in countries with high endemic rates of STDs or HIV. Feedback obtained from the staff of the MSG Battalion Headquarters in Quantico, VA, confirmed the applicability of the content and format of SHIP for the MSG population.

The goals of the present intervention for this sample of MSGs were to (1) increase knowledge about the transmission, prevention, and medical outcomes of STDs/HIV, (2)

prevent or reduce the frequency of the behaviors associated with STD/HIV acquisition, and (3) build more effective decision-making, problem-solving, and communication skills.

The overall objective of the analyses reported in this paper was to determine the effectiveness of the MSG version of SHIP. Specifically, the objectives were to determine whether the intervention program had a significant impact on the Marines' knowledge of STDs/HIV, attitude towards safe sex, and behavioral intentions regarding safe sex. The effects of the program on the MSGs' sexual behavior will be evaluated in a follow-up investigation 1 year after the intervention.

Method

Description of SHIP

Prior to modifying the original SHIP course for the MSG school, SHIP was demonstrated to the MSG school staff, and the school leadership approved the addition of this intervention to the MSG school curriculum. The modification effort was guided by information gathered from meetings with MSG school staff and from focus groups conducted with MSGs and Marine leaders at selected embassies around the world. Based on the information obtained from the MSG staff and the focus groups, a new version of SHIP was designed for the MSG school.

The SHIP curriculum was changed from the original four 2-hr session format to a three 2-hr session format to fit the constraints of the MSG school schedule. Two of the original SHIP group exercises were eliminated, several of the lecture/slides segments were condensed, a condom demonstration using alcohol-impairment goggles was added, and the course information was generally tailored and made more relevant to the MSGs and their lifestyle. An outline of the SHIP curriculum developed for the MSG population is shown in Table 1.

SHIP is a multifaceted skills-building intervention designed to modify behaviors associated with the acquisition of STDs/HIV. SHIP uses a variety of media to present information about STDs/HIV and their prevention. Specifically, slide presentations, interactive educational games, group discussions, and videos were developed or selected to present the following content areas: (1) the epidemiology of STDs and HIV/AIDS in young adults; (2) the transmission and prevention of STDs/HIV; (3) the signs, symptoms, and outcomes of common STDs; (4) the clinical course of HIV/AIDS; (5) the impact of alcohol on unsafe sex; (6) correct condom use; and (7) the values and opinions related to STDs/HIV risk (see Table 1). Two videotapes, "HIV Legacy" and "Liberty Brief," were produced specifically for the SHIP curriculum; a third videotape, "Condom-Eze," was also used to demonstrate the correct use of condoms. Alcohol impairment goggles were used to demonstrate the effects of a simulated .20 blood alcohol-level on condom use.

Subjects

All prospective MSGs must graduate from the MSG school in Quantico before being assigned to an embassy. The MSG school course graduates five classes per year, with an average of 95 graduates (range 70-130 students) per class. The revised SHIP

curriculum was given to all MSG students who went through the school between February 1998 and February 1999. Six classes of MSGs received the intervention (February 1998, April 1998, June 1998, September 1998, November 1998, and February 1999).

A total of 584 Marines participated in the SHIP course. With the exception of the course evaluation data, the analyses in this report are based only on the MSGs who (1) had matching pretest and posttest questionnaires, and (2) who reported a marital status of "Single" or "Divorced/Widowed." Married subjects were not included in the analysis. One hundred and seventy-one subjects were dropped because they did not have matching pretests and posttests, and an additional 13 subjects were dropped either because they were married or they did not indicate their marital status. This resulted in a final sample of 400; for some analyses, sample sizes are smaller due to missing data.

A description of the sample is presented in Table 2. The sample was predominantly male (94%). The participants ranged in age from 19 to 33 years, with a mean age of 21.8. The major ethnic groups were White/Caucasian (70%), Hispanic (14%), and Black (10%). The remaining subjects (6%) were Asian/Pacific Islander or "Other." Tenure in the Marine Corps ranged from 10 months to 13 years, with a mean of 2.9 years. Most of the participants (58%) had graduated from high school or had earned a General Educational Development (GED) certificate but had not attended college. An additional 38% had also completed some college but did not have a college degree; 4% had attained a 2- or 4-year college degree.

Measures

The questionnaires administered to the MSGs before and after the intervention (pretests and posttests) consisted of a measure of STD/HIV knowledge, 9 psychosocial scales, and a set of demographic and sexual history questions. The STD/HIV knowledge measure was composed of 21 true-false questions and 3 short answer items. It was developed specifically for this study. Scores for STD/HIV knowledge were obtained by summing the total number of correct responses, which yielded a lowest possible score of zero and a highest possible score of 29 (coefficient alpha = .62). Internal consistency reliability estimates are generally low on knowledge scales because knowledge is a heterogeneous construct.

The 9 psychosocial scales included on the pretests and posttests were as follows:

(1) Social Norms I is a 3-item measure developed by Marin, Gomez, Tschann, & Gregorich (1997). It assesses the degree to which an individual believes that his or her peers carry condoms and use them consistently. An example of an item is: "How many of your closest friends do you think use condoms with every partner?" In the Marin et al. (1997) sample, this scale had a coefficient alpha of .83.

(2) Social Norms II is a 4-item scale, based on a scale developed by Boyer et al. (1997a). It assesses the degree to which a person believes that his or her friends support condom use and other safe sex behaviors. A sample item is: "During the next 6 months, my friends will encourage me to use condoms when I have sex."

(3) Attitudes Toward Condoms is an 8-item scale, developed specifically for this study. It measures the degree to which condoms are perceived in a positive versus a negative light (e.g., "Condoms can ruin the sexual mood.")

(4) Self-Efficacy/Impulse Control is a 5-item scale developed by Marin et al. (1997). It measures the degree to which a person believes that he or she can use condoms consistently, even under circumstances requiring a high degree of impulse control (e.g., as when under the influence of alcohol or drugs). A typical item is: "Can you stop and look for condoms when you are sexually aroused?" In the Marin et al. (1997) sample, this scale had a coefficient alpha of .73.

(5) Condom Assertiveness is a 3-item scale developed by Brien, Thombs, Mahoney, and Wallnau (1994). It measures an individual's confidence in his or her ability to suggest using condoms in various situations (e.g., with a new sexual partner). An example of an item is: "I feel confident in my ability to suggest using condoms with a new partner." In the Brien et al. (1994) sample, a coefficient alpha of .80 was obtained for this scale.

(6) Self-Efficacy for Communicating With a New Sexual Partner is a 4-item scale developed by Boyer et al. (1997b). This scale assesses a person's belief that he or she can communicate with a new sexual partner about STD/HIV risk factors. A typical item is: "In the next 6 months, how hard would it be for you to ask a new partner if he or she had ever had an STD?" A coefficient alpha of .84 was found for this scale (Boyer et al., 1997b).

(7) AIDS Preventive Behavior. This 4-item scale was developed by Goldman and Harlow (1993). It measures a person's AIDS-preventive attitudes and behaviors (e.g., the belief that one can take steps to prevent getting AIDS). An example of an item is: "I am cautious and careful about not getting myself into situations that could lead to getting the AIDS virus." In the Goldman and Harlow (1993) data, this scale had a coefficient alpha of .72.

(8) Behavioral Intentions. This 4-item scale was developed specifically for this study. It measures an individual's intentions to use condoms in the future. It was modeled after the Intentions to Use Condoms scale developed by Sanderson and Jemmott (1996). A typical item is: "How likely is it that you will use condoms if you decide to have sex in the next 6 months?"

(9) Perceived Susceptibility to STDs/HIV. This 2-item scale was developed by Boyer et al. (1997a) in an earlier study of STDs/HIV in the military. It measures an individual's perceptions of vulnerability toward contracting an STD/HIV in the near future (e.g., "What do you think the chances are that you will get the AIDS virus on your next tour of duty?") In the earlier SHIP study, this scale had a coefficient alpha of .84 (Boyer et al., 1997a).

The constructs measured by these scales can theoretically be expected to be associated with safer sexual behavior. Moreover, based on the literature, each of these

domains might theoretically be expected to change as a result of the STD/HIV intervention.

The coefficient alphas (internal consistency reliability) computed for the psychosocial scales for the present data are shown in Table 3. They ranged in magnitude from .65 to .89.

The questionnaire also contained demographic items assessing race/ethnic background, education level, marital status, age, gender, and tenure in the Marine Corps. A short sexual history section included the following questions: (1) "Have you ever had sexual intercourse?", (2) "At what age did you first have sexual intercourse?", (3) "Have you had sexual intercourse during the past year?", (4) "How many different people have you had sexual intercourse with during the past year?", and (5) "When you had sexual intercourse during the past year, what percentage of the time did you use a condom?" The answer choices for the condom use question were percentages ranging from 0% to 100% in 10% increments.

In addition to the pretest and posttest questionnaires, the MSGs were administered a course evaluation questionnaire at the end of the intervention program. This questionnaire assessed the MSGs' satisfaction with the course overall, and with specific aspects of the course (e.g., the instructor(s), videos, group discussions, lectures). The participants did not put any personal identifying information on the course evaluation forms.

Procedure

The evaluation of the STD/HIV intervention used a pretest-posttest design. The pretest and posttest questionnaires were identical; each was made up of the scales previously described in the Measures section. Pretests and posttests were administered to MSGs in a classroom setting at the MSG school in Quantico. Pretests were administered approximately 2 weeks prior to the SHIP course. Posttests were administered approximately 1 week subsequent to the SHIP course. To preserve participants' anonymity, neither names nor social security numbers were asked for on the pretest or posttest questionnaires. Instead, participants were given instructions on how to create self-generated identification numbers on the questionnaires; these were then used to match the pretest and posttests for each individual. This method has been successfully used in a number of other STD/HIV investigations (e.g., O'Leary, Jemmott, Goodhart, & Gebelt, 1996).

It was hypothesized that exposure to the behavioral intervention would lead to significant increases in STDs/HIV knowledge and more favorable (i.e., safer) attitudes and intentions regarding safe sex.

Results

Sexual Behavior of the Sample

Sexual history information about the sample ($N = 400$) is provided in Table 4. The vast majority of the sample (92%) stated that they had had sexual intercourse during the past year. Most of the Marines had not used condoms consistently in the past year. About one third (32%) of the sample had used condoms 100% of the time in the past year. Five percent of the sample had not used condoms at all in the past year. Most of the participants (63%) reported that they had used condoms between 10% and 90% of the time. The mean percentage of the time that condoms were used in the past year was 74%.

Table 4 shows the number of different people whom subjects had had sexual intercourse with in the past year. The mean number of sexual partners was 3.3. Most of the Marines in the sample reported having either 1 partner (20%), 2 partners (27%), or 3-4 partners (23%). However, 11% of the sample reported having 7 or more sexual partners in the past year.

Most of the subjects (91%) stated that they had never been diagnosed with an STD. Five percent of the sample reported that they had been diagnosed with an STD, and an additional 4% were unsure.

Effects of the Intervention

Paired t tests comparing subjects' pretest and posttest means on each scale were performed to assess the effects of the behavioral intervention. The results of these analyses are presented in Table 5. Consistent with our hypotheses, scores on the STD/HIV knowledge measure were significantly higher after the intervention than before, $t(1, 393) = -20.78$, $p < .01$. The average knowledge score increased from a mean of 22.71 to a mean of 25.10 (out of a possible 29).

Significant differences between pretest and posttest means were found on 4 of the psychosocial scales: Social Norms II, Attitudes Toward Condoms, Self-Efficacy/Impulse Control, and Behavioral Intentions. On Social Norms II, the difference was as expected: subjects perceived greater social norms supporting condom use after the intervention than they had before, $t(1, 391) = -4.61$, $p < .01$. On Behavioral Intentions, the difference was also in the expected direction; MSGs expressed stronger intentions to practice safe sex after the intervention than they had before, $t(1, 386) = -7.02$, $p < .01$.

On Attitudes Toward Condoms and Self-Efficacy/Impulse Control, the differences were not as expected. On Attitudes Toward Condoms, MSGs actually expressed a less positive attitude toward condoms after the intervention than they had before, $t(1, 388) = 2.61$, $p < .01$. Similarly, results on the Self-Efficacy/Impulse Control scale indicated that the MSGs actually felt less confident about being able to use a condom in difficult situations (e.g., when under the influence of alcohol) after the intervention than they had before, $t(1, 368) = 2.85$, $p < .01$.

No significant pretest/posttest differences were found on any of the other scales (Social Norms I, Condom Assertiveness, Self-Efficacy for Communicating With a New Sexual Partner, AIDS Preventive Behavior, Behavioral Intentions, and Perceived Susceptibility to STDs/HIV).

Student Evaluations of Program

Four hundred and sixty-one participants completed course evaluation questionnaires. This number is larger than the sample of 400 used in the other analyses because the course evaluation sample includes all participants, including those who did not have matching pretests and posttests and those who were married. The course evaluation form did not ask for any identifying information or demographics and could not be matched to the pretests or posttests. Therefore, data from all respondents who completed course evaluation forms were included in this analysis.

On the course evaluation questionnaire, the participants were asked to rate various aspects of the course using the following 5-point scale: (1) Unsatisfactory, (2) Poor, (3) Satisfactory, (4) Good, and (5) Excellent (see Table 6). As Table 6 shows, satisfaction with the course overall was high, with a mean rating of 4.53. This indicates an average rating that falls about halfway between "Good" and "Excellent." Mean ratings of specific aspects of the course (e.g., videos, lecture) were also high, ranging from a low of 4.17 for Group Discussions to a high of 4.67 for Instructor(s).

In response to the question: "How much did you learn from the program?", 84% of the SHIP participants indicated that they had learned either "a great deal," "a substantial amount," or "a moderate amount." The remaining 16% of the sample said that they had learned "a slight amount" or "very little." The course evaluation form also asked: "Did you find the program useful in terms of reducing your personal risk for STDs/HIV?" Eighty-eight percent of the participants answered "definitely yes" or "yes" to this question, 8% answered "neutral," and 4% answered "no" or "definitely no." In response to the question, "Would you recommend this course to other Marines?", 93% of the sample answered "definitely yes" or "yes."

In summary, the results of the course evaluation data suggest that the MSG students were satisfied with the SHIP course overall as well as with all specific components of the course (e.g., videos, lectures). Most of the MSGs indicated that they had learned new information from the program, had found the course useful in terms of reducing their personal risk for STDs/HIV, and would recommend the course to other Marines.

Correlates of Condom Use

To get a better understanding of the psychological factors that play a role in condom use in this sample of Marines, correlation coefficients were computed between the psychosocial scales and responses to the question asking the percentage of the time that MSGs had used condoms in the past year. These correlations are shown in Table 7. Although the condom use question was included on both the pretest and the posttest, in these analyses the pretest data were used. Because some participants did not answer the

condom use question, either because they had not had sex in the past year ($n = 31$) or because they simply chose to skip that question ($n = 10$), the results reported in this section (and shown in Table 7) are based on a sample of 359 participants.

Knowledge of STDs/HIV had a small inverse association with condom use ($r = -.11, p < .05$). Individuals with greater knowledge of STDs and HIV used condoms somewhat less often during the past year than individuals with less knowledge. Because this result seemed puzzling, a partial correlation was computed between STD/HIV knowledge and condom use, controlling for age and tenure in the Marines. However, the resulting partial correlation ($pr = -.11, p < .01$) was exactly the same as the zero-order correlation between knowledge and condom use.

All but two of the psychosocial measures were significantly correlated with self-reported condom use in the past year (see Table 7). The scale with the strongest association with condom use was Behavioral Intentions ($r = .48, p < .01$). Individuals who expressed stronger intentions to use condoms in the future were much more likely to have used condoms consistently in the past than those with weaker behavioral intentions. Attitudes Toward Condoms also correlated strongly with condom use in the past year ($r = .43, p < .01$). This indicates that individuals with a more positive attitude toward condom use were more likely to have used condoms consistently in the previous year than those with a less positive attitude.

Both of the social norms scales had significant associations with condom use. Social Norms I and Social Norms II correlated .38 ($p < .01$) and .33 ($p < .01$), respectively, with self-reported condom use. Thus, individuals who perceived strong social norms for condom use—that is, those who believed that their friends use condoms and that their friends are supportive of condom use—were more likely to have used condoms consistently in the past year.

Self-Efficacy/Impulse Control was also significantly associated with condom use ($r = .37, p < .01$). Individuals with high self-efficacy for using condoms in circumstances requiring impulse control had, in fact, used condoms more consistently in the past year than individuals with lower self-efficacy. Similarly, Condom Assertiveness was also positively correlated with consistent condom use ($r = .32, p < .01$). This shows that individuals with more confidence in their ability to suggest or discuss the use of condoms with a sexual partner had used condoms more consistently in the past year than their less assertive counterparts.

AIDS Preventive Behavior was positively associated with condom use ($r = .27, p < .01$). This indicates that individuals who held a strong belief that they could take steps to prevent getting AIDS were more likely to use condoms than those who did not hold this belief.

Two of the psychosocial scales were not linked with condom use. Neither Perceived Susceptibility to STDs/HIV ($r = -.07, p > .10$) nor Self-Efficacy for Communicating With a New Sexual Partner ($r = .03, p > .10$) was significantly associated with condom use.

Condom use in the past year was also examined in relation to each of the demographic variables (age, tenure in the Marines, race/ethnic status, and educational level). For the continuous demographic variables (e.g., age), correlation coefficients were computed with condom use. For the categorical demographic variables (e.g., race/ethnic status), one-way analyses of variance were performed. None of these associations was statistically significant (all p's > .10). Condom use in the past year was also examined in relation to age at first intercourse, age at first condom use, and number of sexual partners during the past year. None of these correlations were significant (all p's > .10).

Discussion

The objective of this study was to determine the effectiveness of an STD/HIV intervention program in a sample of MSGs. These Marines are a fairly high-risk group because they are assigned to embassies all over the world, including countries with high rates of HIV and/or STDs, and they generally do not use condoms consistently.

Comparisons of the pretest and posttest questionnaires revealed that SHIP did, in fact, lead to a significant increase in the Marines' knowledge of STDs/HIV. This occurred despite the fact that their levels of knowledge were quite high initially. The intervention also led to a significant increase on a measure of perceived social norms about condom use. Higher perceived levels of peer condom use and peer support for condom use were reported after the intervention than before. Another positive finding was the fact that behavioral intentions to engage in safe sex were significantly higher after the intervention. These findings are, of course, consistent with our expectations, and they provide evidence for the effectiveness of the intervention.

The intervention also produced some effects, however, that were contrary to expectation. Participants' attitudes toward condoms actually became less positive after the intervention. In addition, scores on a scale that assessed self-efficacy for using condoms in difficult situations (e.g., when drinking alcohol) were significantly lower following the intervention. Both of these findings are puzzling.

The finding of more negative attitudes toward condoms subsequent to the intervention was also found in an earlier study of SHIP, using a different measure of condom attitudes in a large Marine Corps sample (Boyer et al., 1997a). Why would attitudes toward condoms become less positive as a result of SHIP? SHIP clearly emphasizes the importance of consistent condom use as the primary way to avoid STDs/HIV. In addition, the curriculum includes a demonstration of correct condom use, a video about condoms, and group discussions about why condoms are liked or disliked and about sexual decision-making with regard to condoms. Although it seems surprising that exposure to all of this information about condoms would lead participants to feel more negatively toward them, it may be that the discussions about condoms actually made the negative features of condoms more salient to participants. Alternatively, because many parts of the SHIP curriculum are aimed at increasing participants' sense of vulnerability to STDs/HIV, it may be that increased awareness of the importance of using condoms

combined with thoughts about the negative features or difficulties associated with their use had the net effect of making attitudes toward condoms more negative.

It is also puzzling that the Self-Efficacy/Impulse Control scores were significantly lower after the intervention than before. Because the SHIP course includes a lecture and discussion about situations in which condoms may be difficult to use (e.g., when drinking alcohol), as well as a condom demonstration using alcohol-impairment goggles, these aspects of the course may have heightened the Marines' awareness of difficulties of using condoms or reminded them of difficulties they had in the past in handling these situations. It seems reasonable that this heightened awareness of the difficulties of using condoms could have led to a decrease in Self-Efficacy/Impulse Control.

Analysis of the correlations between condom use and the psychosocial measures used in this study revealed a number of psychosocial variables that had substantial associations with self-reported condom use during the past year. Behavioral Intentions was the psychosocial variable with the strongest association with condom use. Other variables that were positively associated with condom use were Attitudes Toward Condoms, Social Norms, Self-Efficacy, Condom Assertiveness, and the belief that one can take steps to prevent getting AIDS. These findings are consistent with past literature on the correlates of condom use (e.g., Abraham, Sheeran, Spears, & Abrams, 1992; Brown, DiClemente, & Park, 1992; Sheeran, Abraham, & Orbell, 1999). Behavioral intentions have generally been found to be more consistently related to condom use than any other psychosocial variable (see meta-analysis by Sheeran et al., 1999). Attitudes toward condoms have also been found to be very consistently associated with condom use (Abraham et al., 1992; Bryan, Aiken, & West, 1997; Catania, Coates, & Kegeles, 1994; Sheeran et al., 1999). Our findings regarding the other psychosocial variables (e.g., Social Norms, Self-Efficacy) are also consistent with past research on condom use (Brown et al., 1992; Marin et al., 1997; Peterson et al., 1992).

When the results regarding the effects of the SHIP course and the psychosocial correlates of condom use are considered together, an interesting picture emerges. The intervention seemed to strengthen behavioral intentions, and behavioral intentions can be expected to predict greater condom use in the future. The intervention also seemed to increase perceived social norms for condom use, and social norms can be expected to lead to greater condom use in the future. These are very positive findings. However, at the same time, the intervention seemed to cause attitudes toward condoms to become more negative and also led to decreased self-efficacy for using condoms in difficult situations. Both of these processes could theoretically be expected to contribute to less consistent condom use in the future. In light of these apparently contradictory forces, it will be interesting to determine in the 1-year follow-up investigation if SHIP has an impact on condom use among MSGs.

Conclusions

The STD/HIV Intervention Program produced a significant increase in the Marines' knowledge of STDs/HIV. In addition, the intervention led to stronger perceived social norms for condom use and stronger behavioral intentions to engage in safe sex.

However, the intervention also produced some unanticipated effects (e.g., attitudes toward condoms became less positive). The results of the 1-year follow-up investigation will allow us to determine the impact of this intervention on sexual behavior.

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Table 1

Outline of STD/HIV Intervention Program for MSGs

	Session One		
Module 1	Overview of STDs/HIV/AIDS	15 min	slides/lecture
Module 2	Transmission of STDs and HIV	10 min	slides/lecture
Module 3	Prevention	10 min	slides/lecture
Module 4	Values Voting	25 min	group exercise
Module 5	Risk Evaluation	20 min	group exercise
Module 6	STD Outcomes	10 min	slides/lecture
Module 7	Physical Outcomes	5 min	slides/lecture
Module 8	HIV/AIDS Clinical Course	5 min	slides/lecture
Homework:	Feelings and Opinions Survey	5 min	homework
	Session Two		
Module 1	Feelings and Opinions Survey	25 min	group exercise
Module 2	"Liberty Brief" Video	35 min	video & discussion
Module 3	Risk/Prevention of STDs/HIV	10 min	slides/lecture
Module 4	Alcohol Use/Abuse	5 min	slides/lecture
Module 5	Reasons for Drinking	10 min	slides/lecture
Module 6	Alcohol Use in the Military	5 min	slides/lecture
Module 7	"HIV Legacy" Video	20 min	video & discussion
Homework:	Alcohol and Sexuality Questionnaire	5 min	homework
	Session Three		
Module 1	Alcohol and Sexuality Questionnaire	25 min	group exercise
Module 2	Prevention Baseball	25 min	game
Module 3	Role Play: Sexual Decision-Making	25 min	role play
Module 4	"Condom-Eze" Video	10 min	video & discussion
Module 5	Correct Condom Use Exercise	15 min	group exercise
Module 6	Wrap-Up Exercise and Course Evaluation Form	10 min	group exercise

Table 2

Demographic Characteristics of the Sample

Demographic Characteristic	%
Sex	
Male	94%
Female	6%
Age (years)	
19-21	53%
22-24	36%
25-27	9%
28+	2%
Race/ethnic status	
White/Caucasian	70%
Black	10%
Hispanic	14%
Asian/Pacific Islander	3%
Other	3%
Tenure in the Marine Corps	
< 2 years	19%
2–4 years	71%
> 4 years	10%
Education level	
High school graduate/GED	58%
Some college (no degree)	38%
College degree (2- or 4-year)	4%

$N = 400$.

Table 3

Coefficient Alphas for Pretest and Posttest Measures

Scale	Pretest	Posttest
Social Norms I	.79	.80
Social Norms II	.65	.65
Attitudes Toward Condoms	.85	.82
Self-Efficacy/Impulse Control	.75	.73
Condom Assertiveness	.85	.85
Self-Efficacy for Communicating With a New Sexual Partner	.86	.89
AIDS Preventive Behavior	.67	.66
Behavioral Intentions	.84	.85
Perceived Susceptibility to STDs/HIV	.83	.82

Table 4

Sexual History Information About the Sample

Have you had sexual intercourse during the past year?

Response	% of Sample
Yes	92%
No	8%

What percentage of the time did you use condoms when you had sexual intercourse during the past year?

Response	% of Sample
0%	5%
10%-30%	10%
40%-60%	14%
70%-90%	39%
100%	32%

How many different people have you had sexual intercourse with during the past year?

Response	% of Sample
0 partners	8%
1 partner	20%
2 partners	27%
3-4 partners	23%
5-6 partners	11%
7 or more partners	11%

Have you ever been diagnosed with an STD?

Response	% of Sample
Yes	5%
Unsure	4%
No	91%

$N = 400$.

Table 5

Results of Paired *t* Tests Comparing Pretest and Posttest Measures

Scale	Pretest Mean	Posttest Mean	*t*	*p*
STD/HIV Knowledge	22.71	25.10	-20.78	< .01
Social Norms I	9.92	10.05	-1.15	*ns*
Social Norms II	13.08	13.69	-4.61	< .01
Attitudes Toward Condoms	25.32	24.77	2.61	< .01
Self-Efficacy/Impulse Control	21.19	20.78	2.85	< .01
Condom Assertiveness	13.27	13.17	1.16	*ns*
Self-Efficacy for Communicating With a New Sexual Partner	14.95	14.88	0.43	.08
AIDS Preventive Behavior	14.44	14.39	0.78	*ns*
Behavioral Intentions	17.34	18.08	-7.02	< .01
Perceived Susceptibility to STDs/HIV	3.30	3.40	-1.74	*ns*

Note. *ns* = nonsignificant, $p > .10$.

Table 6

Student Evaluations of the Program

Course Element	Mean Rating	*SD*
Course Overall	4.53	.63
Instructor(s)	4.67	.53
Lecture	4.44	.62
Videos	4.49	.72
Group Discussions	4.17	.84
Group Exercises (e.g., games)	4.25	.82

Note. Ratings were made on a scale of 1 to 5: (1) Unsatisfactory, (2) Poor, (3) Satisfactory, (4) Good, and (5) Excellent.

$N = 461$.

Table 7

Correlations of Psychosocial Scales With Condom Use

Scale	Correlation
STD/HIV Knowledge	-.11*
Social Norms I	.38**
Social Norms II	.33**
Attitudes Toward Condoms	.43**
Self-Efficacy/Impulse Control	.37**
Condom Assertiveness	.32**
Self-Efficacy for Communicating With a New Sexual Partner	.03
AIDS Preventive Behavior	.27**
Behavioral Intentions	.48**
Perceived Susceptibility to STDs/HIV	-.07

$N = 359$.

** $p < .01$. * $p < .05$.

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Although military personnel are at high risk for sexually transmitted diseases (STDs) and HIV, behavioral interventions to prevent STDs/HIV in U.S. military populations have been lacking. In this study, a behavioral intervention was implemented and evaluated in a sample of Marine Security Guards (MSGs). Participants were assessed prior to and following a 3-session intervention on a measure of STD/HIV knowledge and a number of psychosocial scales. Paired comparisons of pretest and posttest scores revealed that STD/HIV knowledge was significantly higher after the intervention. Significant pretest versus posttest differences were also found on Social Norms, Behavioral Intentions, Attitudes Toward Condoms, and Self-Efficacy/Impulse Control. On Social Norms and Behavioral Intentions, the differences were as expected; subjects perceived greater social norms supporting condom use and expressed stronger intentions to practice safe sex after the intervention than they had before. On Attitudes Toward Condoms and Self-Efficacy/Impulse Control, the differences were not as expected after the intervention. MSGs actually expressed less positive attitudes toward condoms and felt less confident about being able to use a condom in difficult situations. Psychosocial factors that correlated significantly with self-reported condom use were also identified. Implications of these findings were discussed.

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