NAVAL HEALTH RESEARCH CENTER

ONE-YEAR FOLLOW-UP EVALUATION OF THE SEXUALLY TRANSMITTED DISEASES/HUMAN IMMUNODEFICIENCY VIRUS INTERVENTION PROGRAM IN A MARINE CORPS SAMPLE

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One-Year Follow-Up Evaluation of the Sexually Transmitted Diseases/Human Immunodeficiency Virus Intervention Program in a Marine Corps Sample

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Although a substantial number of studies have been conducted to evaluate the impact of various human immunodeficiency virus (HIV) prevention programs, most of them have focused on civilian populations. There is a clear need to develop and evaluate sexually transmitted diseases (STD)/HIV prevention programs designed specifically for U.S. military populations. The objective of the present study was to determine whether a behavioral intervention known as the STD/HIV Intervention Program (SHIP) would have a sustained positive impact on the behavior of a sample of Marines. A 1-year follow-up telephone interview was administered to (1) Marines who participated in the SHIP course (intervention group), and (2) a quasi-control group of Marines who were not exposed to the SHIP course. The intervention and control groups differed significantly in the percentage of the time they had used condoms during the past year. The intervention participants reported using condoms a greater percentage of the time than the nonparticipants.

Introduction

Human immunodeficiency virus (HIV) remains one of the most serious public health threats of our time. Recent estimates indicate that approximately 297,000 people in the United States are living with acquired immunodeficiency syndrome (AIDS) and an additional 44,000 are diagnosed with the disease every year.[1] Because it is unlikely that an effective treatment or vaccine for HIV/AIDS will be available in the near future, prevention remains the primary method for stopping the further spread of HIV.

A growing body of research evidence indicates that reductions in risky behavior can occur as a result of certain well-designed interventions.[2-4] Behavioral interventions have reduced rates of unprotected sexual intercourse in a variety of populations, including college students,[5,6] African American adolescents,[7,8] homosexual and bisexual men,[9,10] runaway teenagers,[11] low-income women,[12] and pregnant women.[13] A meta-analysis demonstrated that cognitive-behavioral HIV risk reduction interventions significantly reduce HIV risk behaviors, with small to moderate effect sizes.[14] Moreover, a National Institutes of Health Consensus Panel concluded that behavioral interventions to reduce HIV/AIDS are effective and should be widely disseminated.[15]

Although a substantial number of studies have been conducted to evaluate the impact of various HIV prevention programs, these studies have focused on civilian rather than military populations. Research on HIV behavioral interventions among U.S. military personnel has been lacking. Yet, unsafe sex among military personnel is a concern. Military personnel may be at especially high risk for sexually transmitted diseases (STDs) and HIV as a result of their demographic characteristics (e.g., young age and predominantly male gender), their deployments, and their assignments to foreign countries with high rates of STDs and HIV. Previous studies of U.S. military personnel have documented a number of factors that contribute to STD acquisition, including sexual contact with commercial sex workers, heavy alcohol use, and inconsistent use of condoms.[16] There is a clear need to develop and evaluate STD/HIV prevention programs designed specifically for U.S. military populations.

In a predecessor to the current project, a cognitive-behavioral intervention program known as the STD/HIV Intervention Program (SHIP) was developed to prevent STDs and HIV among Marines.[17] Focus groups were used in the early stages of program development to ensure appropriateness for this military population. The content and format of the intervention were based on the information-motivation-behavioral skills model.[18,19] The SHIP course was designed to increase the Marines' level of knowledge about STDs/HIV, to increase their motivation to avoid STDs/HIV and engage in safer behaviors, and to help them develop behavioral skills for preventing STDs/HIV. The program used a variety of media (e.g., videotapes, slides) to present information and included small-group discussions and other interactive group activities.

SHIP was first implemented in a large sample of enlisted Marines aboard ships deployed to the Western Pacific in 1994. The initial evaluation of SHIP[17] showed that it resulted in 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).

A second study on SHIP was conducted with a sample of Marine Security Guards (MSGs), who are Marines assigned to

guard and protect U.S. embassies located around the world, including developing 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 because they are single, mostly young (younger than 30 years), predominately male, and often stationed in countries with high endemic rates of STDs or HIV.

In the MSG study,[20] a pre-/post-test design was used to determine whether SHIP had a significant short-term impact on MSGs' knowledge, attitudes, and intentions. The results indicated that SHIP produced a significant increase in the Marines' knowledge of STDs/HIV. In addition, the intervention increased participants' perceived social norms for condom use and behavioral intentions to engage in safe sex, although some unanticipated effects were also found (e.g., attitudes toward condoms became less positive).

The objective of the present study was to determine whether the SHIP course still had a significant impact on MSGs' sexual behaviors 1 year after the intervention. To answer this question, we compared MSGs who were previously enrolled in the course with MSGs who were not enrolled.

Method

Overview of Research Design

Marines attending the MSG school in Quantico, Virginia, were exposed to an STD/HIV prevention program known as SHIP. The 6-hour SHIP curriculum was given to all MSGs who attended the MSG school between February 1998 and February 1999. One year after they graduated from MSG school, telephone interviews were administered to MSGs who had been exposed to the SHIP course (intervention group). A quasi-control group of MSGs who had not been exposed to SHIP were also administered telephone interviews 1 year after they graduated from MSG school. The purpose of the interviews was to determine whether individuals who were exposed to SHIP had safer sex behaviors (e.g., greater condom use) during their first year as MSGs than comparable individuals who had not participated in SHIP. No baseline data were collected.

Description of SHIP

Before developing an MSG version of SHIP, the original SHIP course that was developed for fleet Marines[17] was demonstrated to the MSG school staff. Minor modifications to the program were made based on guidance and feedback from the staff. To fit the constraints of the MSG school schedule, the SHIP curriculum was changed from the original 8-hour format to a 6-hour format. The course modules were rearranged from a set of four 2-hour sessions into a set of three 2-hour sessions. Two of the original SHIP group exercises were eliminated, several of the lecture/slide segments were condensed, a condom demonstration using alcohol-impairment goggles was added, and some course information was made more relevant to the MSGs and their lifestyles (e.g., some course examples were framed within the context of living and working in a foreign country). An outline of the SHIP curriculum developed for the MSG population is shown in Table I.

SHIP is a multifaceted skills-building intervention designed to modify behaviors associated with the acquisition of STDs/HIV.

A variety of media were used to present information about STDs/HIV and their prevention. Specifically, slide presentations, interactive educational games, group discussions, and videos were used 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) 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) personal values and opinions related to STDs/HIV risk (Table I). Two videotapes, "HIV Legacy" and "Liberty Brief," were produced specifically for the SHIP curriculum. "HIV Legacy" presents interviews with actual U.S. military personnel who are infected with HIV. "Liberty Brief" is about U.S. military personnel going on liberty who are faced with choices regarding sexual behavior and social interactions with women in foreign countries (e.g., Thailand). A third videotape, "Condom-Eze," was used to demonstrate the correct use of condoms. Alcohol impairment goggles were used to demonstrate the effects of a simulated 0.20 blood alcohol level on condom use.

SHIP Procedures

The SHIP class was presented in three 2-hour sessions on 3 consecutive days during the Marines' normal classroom training time. A Navy corpsman and a civilian instructor, both experienced in HIV prevention training, gave the SHIP training. All MSG students (within a class/cohort) attended the SHIP sessions simultaneously. All MSG students attended all three sessions, although a few students missed small parts of individual sessions. The SHIP program was given during the 5th week of the 8-week MSG training school.

Participants

The mission of the MSG school is to train Marines for MSG duty, which consists of guarding and protecting U.S. embassies in foreign countries. All prospective MSGs must graduate from the MSG school before being assigned to an embassy. The school graduates five classes per year, with an average of about 95 graduates (range, 70–130 students) per class.

The MSGs who graduated from the first three classes to receive the SHIP training (February 1998, April 1998, and July 1998) made up the pool of intervention participants. The intervention group was randomly drawn from these three classes of MSGs. The control group was randomly drawn from the population of MSGs who had graduated from MSG school in the 12 months before the implementation of SHIP. The demographic characteristics of the two groups (e.g., age, tenure in the Marines) were comparable, as will be discussed below.

Follow-Up Interviews

MSGs were contacted and interviewed 12 months (±3 weeks) subsequent to their recorded graduation date. The 1-year follow-up interview consisted of a mixture of open- and closed-ended questions. Specifically, the interview obtained information in the following content areas: (1) demographics characteristics, (2) sexual behavior within the past 12 months, (3) extent of condom use, (4) discussions with sexual partners, (5) alcohol consumption, and (6) STD diagnoses.

The MSG school provided the researchers with rosters of MSGs who had graduated from the school during the periods of

TABLE I

OUTLINE OF STD/HIV INTERVENTION PROGRAM FOR MSGS

Session One		
Module 1	Overview of STDs/HIV/AIDS	15 minutes slides/lecture
Module 2	Transmission of STDs and HIV	10 minutes slides/lecture
Module 3	Prevention	10 minutes slides/lecture
Module 4	Values voting	25 minutes group exercise
Module 5	Risk evaluation	20 minutes group exercise
Module 6	STD outcomes	10 minutes slides/lecture
Module 7	Physical outcomes	5 minutes slides/lecture
Module 8	HIV/AIDS clinical course	5 minutes slides/lecture
Homework	Feelings and opinions survey	5 minutes homework
Session Two		
Module 1	Feelings and opinions survey	25 minutes group exercise
Module 2	"Liberty Brief" video	35 minutes video and discussion
Module 3	Risk/prevention of STDs/HIV	10 minutes slides/lecture
Module 4	Alcohol use/abuse	5 minutes slides/lecture
Module 5	Reasons for drinking	10 minutes slides/lecture
Module 6	Alcohol use in the military	5 minutes slides/lecture
Module 7	"HIV Legacy" video	20 minutes video and discussion
Homework	Alcohol and sexuality	5 minutes homework
Session Three		
Module 1	Alcohol and sexuality	25 minutes group exercise
Module 2	Prevention baseball	25 minutes game
Module 3	Role play: sexual decision making	25 minutes role play
Module 4	"Condom-Eze" video	10 minutes video and discussion
Module 5	Correct condom use exercise	15 minutes group exercise
Module 6	Wrap-up exercise and course Evaluation form	10 minutes group exercise

interest (e.g., the 12 months before February 1998 for the control participants and the 12 months starting in February 1998 for the intervention participants). The MSG school also provided updated rosters to the researchers each time MSGs changed duty locations. The researchers used these rosters to contact the MSGs (both experimental and control participants) to ask them to participate in the telephone interview.

All interviews were conducted over the telephone by trained female interviewers. Because telephone rosters were used to contact the study participants, the interviews were not completely anonymous. However, neither names nor any other identifying information were kept with either the interview response sheets or the computer files that contained the interview data. Because of privacy considerations (and the requirements of our Human Subjects Committee), no attempt was made to link the follow-up data with any other information about the MSGs (e.g., data from MSG school records).

Before starting each phone interview, the interviewer explained the purpose of the study (to learn more about STD and HIV risk factors among MSGs) and asked for the participant's informed consent. Respondents were told that their participation was voluntary and that there would be no negative consequences to them if they declined. They were assured that the information they provided would be kept confidential and would not affect their careers. They were also told that they could decline to answer any questions that made them uncomfortable.

If the prospective participant agreed to participate, the interviewer asked if this was a good time for the interview or if she should call back at another time. Each participant was also asked if he or she was in a private office or room or if one could be made available. The interviewer then proceeded with the interview or made arrangements to call the participant back. Each interview lasted approximately 20 minutes.

Results

A total of 176 of the 190 MSGs who were asked to participate in the telephone interviews agreed to do so, resulting in an overall response rate of 93% (92% for the control group and 94% for the intervention group). The participation rates for the two groups were not significantly different [$\chi^2(1, N = 189) = 0.34$, $p > 0.05$].

Demographic Characteristics

Statistical comparisons were conducted to determine if there were any differences between the intervention and control groups on the demographic variables (Table II). For the continuous variables, t tests were performed; for sex (male vs. female), a χ^2 test was performed. No significant differences between the groups were found. The control and intervention participants were similar on age (means = 23.28 vs. 23.11), tenure (years) in the Marine Corps (means = 4.49 vs. 4.28), and pay grade (means = 4.56 vs. 4.64). The sex distribution of the two groups was also similar: males made up 96.3% of the control group and

	Control Group (N = 80)		Intervention Group (N = 96)		
	Mean	SD	Mean	SD	
Age (years)	23.28	1.8	23.11	2.0	$t = 0.57$
Tenure (years)	4.49	1.1	4.28	1.2	$t = 1.23$
Pay grade	4.56	0.5	4.64	0.5	$t = -0.94$
Sex					$\chi^2 = 0.05$
Male	96.3%		96.9%		
Female	3.7%		3.1%		

None of the comparisons between the control and intervention groups was statistically significant.

96.9% of the intervention group. This distribution also approximates the distribution of males and females in the MSG population as a whole; males made up 96% of the MSGs in 1999 (P.C. Johnson, personal communication, December 21, 1999). None of the participants was married (being single is a requirement of the MSG program).

Sexual Behavior

The responses of the intervention and control participants to the interview questions asking about recent sexual behavior were compared using t tests and χ^2 tests. These results are shown in Table III. As noted in the table, some analyses were based on all participants in the study and some were based only on participants who reported being sexually active in the past 6 months.

Similar percentages of control (80.0%) and intervention participants (83.3%) reported having had sexual intercourse in the past 6 months. In addition, no differences between these two groups were found with regard to the number of sexual partners whom participants had been with in the recent past (i.e., past 6 months or past 12 months). The control and intervention groups had similar means on the total number of sexual partners for the past 6 months (2.00 for the control group, 1.97 for the intervention group; Table III). Ranges and standard deviations for this variable were also similar for the two groups. For the control group, the number of partners for the past 6 months ranged from 0 to 20, with a median of 1.00 (SD = 2.56). For the intervention group, the number of partners for the past 6 months ranged from 0 to 18, with a median of 1.00 (SD = 2.78).

On total number of sexual partners for the past 12 months, the control and experimental groups had similar means (3.91 for the control group, 3.54 for the intervention group). For the control group, the number of partners for the past 12 months ranged from 0 to 45, with a median of 3.00 (SD = 5.44). For the intervention group, the number of partners for the past 12 months ranged from 0 to 35, with a median of 2.00 (SD = 4.72).

The control and intervention groups were also similar in the number of casual sexual partners in the past 12 months (mean of 2.69 for the control group and 2.30 for the intervention group). For the control group, the number of casual partners ranged from 0 to 45, with a median of 2.00 (SD = 5.29). For the intervention group, the number of casual partners in the past 12 months ranged from 0 to 34, with a median of 1.00 (SD = 4.52). The two groups were also similar on the number of sexual partners in the past 6 months whom participants had known for less than 1 week (mean of 0.96 for the control group and 0.72 for the intervention group). For the control group, the number of partners known for less than 1 week ranged from 0 to 45, with a median of 0 (SD = 2.45). For the intervention group, the number of partners known for less than 1 week ranged from 0 to 17, with a median of 0 (SD = 2.25).

Although there was a tendency for the control participants to have slightly more partners than the intervention participants in each category assessed, none of these differences were statistically significant ($p > 0.05$ for all; Table III).

Because increasing participants' condom use is a primary focus of SHIP, the most important question in the follow-up interview was: "Of all the times you had sex in the past 6

TABLE III

SEXUAL BEHAVIOR VARIABLE MEANS

Sexual Behavior Variable	Control Group (N = 80)	Intervention Group (N = 96)	
Percentage of participants who had had sex in the past 6 months	80.0%	83.3%	$\chi^2 = 0.33$
Number of sexual partners, past 6 months	2.00	1.97	$t = 0.08$
Number of sexual partners, past 12 months	3.91	3.54	$t = 0.48$
Number of casual sexual partners, past 12 months	2.69	2.30	$t = 0.52$
Number of sexual partners participant had known for <1 week, past 6 months	0.96	0.72	$t = 0.69$
Percentage of the time participant used a condom, past 6 months[a]	75.3%	85.8%	$t = 2.11$[b]
Percentage of participants who used condoms 100% of the time, past 6 months[a]	42.2%	58.8%	$\chi^2 = 3.90$[b]

[a]Analysis based only on participants (N = 144; 64 control participants and 80 intervention participants) who were sexually active in the past 6 months.
[b]$p < 0.05$.

months, approximately what percentage of the time would you say that you (or your partner) used a condom?" A significant difference between the intervention and control groups was found for this question (Table III). The mean percentage of condom use was 85.8% for the intervention group, compared with 75.3% for the control group [$t(142) = 2.11, p < 0.05$]. Consistent with our hypothesis, the intervention participants reported using condoms significantly more often than the controls.

To explore the possibility that the difference in condom use found between the two groups may have been partly attributable to demographic differences, an analysis of covariance was conducted with group membership (intervention vs. control) as the main effect and age, tenure, and pay grade as the covariates. Results of this analysis showed that group membership still had a significant effect on condom use, even with the demographic variables controlled [$F(4, 139) = 5.26, p < 0.05$]. We can conclude that the differences between the groups on condom use in the past 6 months were not attributable to inequalities on the demographic variables.

We were also interested in determining whether the experimental groups differed on their rates of consistent condom use. To make this determination, the percentages of participants in each group who reported that they had used condoms 100% of the time in the past 6 months were compared. This difference was also significant. As Table III shows, 42.2% of the control group and 58.8% of the intervention group had used condoms 100% of the time in the 6 months preceding the interview [$\chi^2(1, N = 144) = 3.90, p < 0.05$]. Thus, intervention participants were significantly more likely than controls to state that they had used condoms with complete consistency.

To gain a more comprehensive look at the number of sexual partners reported by the two experimental groups, the percentages of participants who had various numbers of sexual partners (e.g., 0 partners, 1 partner, etc.) were calculated for the control and intervention groups. These results are shown in Table IV, with all participants included, whether or not they were sexually active in the past 6 months. As the table shows, the percentages of the two experimental groups reporting each possible number of sexual partners were similar.

For a more detailed look at the frequency of condom use (past 6 months) in relation to the number of sexual partners, frequencies and percentages on these two variables were determined for the control and intervention groups. Although many of the cell sizes are small, the pattern of data for the two experimental groups was very similar (Table V).

TABLE IV

NUMBER OF SEXUAL PARTNERS, PAST 6 MONTHS

Number of Sexual Partners, Past 6 Months	Control Group ($N = 80$)	Intervention Group ($N = 96$)
0	20.0%	16.7%
1	33.8%	36.5%
2	16.3%	29.2%
3	16.3%	9.4%
>3	13.6%	8.2%

$\chi^2 = 6.32, p > 0.10$.

TABLE V

FREQUENCY OF CONDOM USE (PAST 6 MONTHS) IN RELATION TO NUMBER OF PARTNERS

	Control Group ($N = 64$)		Intervention Group ($N = 80$)	
	Number of Partners, Past 6 Months		Number of Partners, Past 6 Months	
Condom Use[a]	1	>1	1	>1
0–15%	7 (10.9%)	2 (3.1%)	3 (3.7%)	0 (0%)
16–50%	4 (6.3%)	2 (3.1%)	7 (8.7%)	2 (2.5%)
51–99%	5 (7.8%)	17 (26.6%)	4 (5.0%)	17 (21.3%)
100%	11 (17.2%)	16 (25.0%)	21 (26.3%)	26 (32.5%)
Total	27 (42.2%)	37 (57.8%)	35 (43.7%)	45 (56.3%)

[a]Percentage of the time participant used a condom, past 6 months. Data are based only on participants ($N = 144$) who were sexually active in the past 6 months.

Discussions with Partners and Sexual Risk Taking

One of the questions in the follow-up interview asked respondents if they had had any discussions about condoms, STDs, or STD prevention with a sexual partner in the past 6 months. Individuals who answered "yes" were also asked how many discussions of this type they had had. All participants were also asked if they had had any discussions with a sexual partner in the past 6 months about their partner's (1) past sexual history, (2) STD/HIV status, or (3) drug use history. Table VI shows the results for these questions.

Participants in the intervention group (82.8%) were somewhat more likely than those in the control group (71.9%) to report that they had had one or more discussions with a partner about condoms, STDs, or STD prevention in the past 6 months, but this difference failed to reach statistical significance [$\chi^2(1, N = 144) = 2.97, p = 0.08$]. Similarly, there was no difference between the groups on the number of discussions they had had with a partner about condoms, STDs, or STD prevention (mean = 2.38 for the control group and 2.34 for the intervention group). There was also no difference between the groups (37.5% for the control group, 38.8% for the intervention group) on whether participants had had a discussion with a partner about their partner's drug use history. However, participants in the intervention group (81.3%) were significantly more likely than those in the control group (65.6%) to indicate that they had had a discussion in the past 6 months with a sexual partner about their partner's sexual history [$\chi^2(1, N = 144) = 4.55, p < 0.05$]. In addition, intervention participants (78.8%) were substantially more likely than control participants (50.0%) to report that they had had a discussion with a sexual partner about the partner's STD/HIV status [$\chi^2(1, N = 144) = 13.09, p < 0.01$].

Two interview questions queried MSGs' recent experiences with regard to combining sex and alcohol. The questions were: "In the past 6 months, of all the times you had sex, what percentage of the time had you been drinking alcohol prior to sex?" and "In the past 6 months, were there any occasions when you think that alcohol may have caused you to take more chances in terms of STDs or pregnancy than you normally would have taken?" Responses to these questions are shown in Table VI. Participants in the control group (41.5%) reported a higher percentage of sexual experiences taking place after drinking than

TABLE VI

MEANS ON PARTNER DISCUSSION AND SEXUAL RISK-TAKING VARIABLES

Variable	Control Group ($N = 80$)	Intervention Group ($N = 64$)	
Percentage of participants who said that they had had a discussion with a sexual partner about condoms, STDs, or STD prevention, past 6 months	71.9%	82.8%	$\chi^2 = 2.97$
Number of discussions the participant had with a sexual partner about condoms, STDs, or STD prevention, past 6 months	2.38	2.34	$t = 0.07$
Percentage of participants who said that they had had a discussion with a sexual partner about partner's sexual history, past 6 months	65.6%	81.3%	$\chi^2 = 4.55^a$
Percentage of participants who said that they had a discussion with a sexual partner about partner's STD/HIV status, past 6 months	50.0%	78.8%	$\chi^2 = 13.09^b$
Percentage of participants who said that they had had a discussion with a sexual partner about partner's drug use history, past 6 months	37.5%	38.8%	$\chi^2 = 0.02$
Percentage of all sexual intercourse occasions that took place after the participant had been drinking, past 6 months	41.5%	30.4%	$t = 2.31^a$
Percentage of participants who said that alcohol may have caused them to take more chances sexually, past 6 months	20.3%	37.5%	$\chi^2 = 5.01^a$

All analyses are based only on participants ($N = 144$) who were sexually active in the past 6 months.
$^a p < 0.05$.
$^b p < 0.01$.

those in the intervention group (30.4%) [$t(143) = 2.31, p < 0.05$]. However, intervention participants (37.5%) were more likely than control participants (20.3%) to agree that alcohol may have caused them to take more chances sexually in the past 6 months than they normally would have taken [$\chi^2(1, N = 144) = 5.01, p < 0.05$].

Most Recent Sexual Relationship

Participants who had been sexually active in the past 6 months were asked a series of questions about their most recent sexual relationship. Specifically, they were asked (1) whether the partner was a casual or a regular partner (with regular partner defined as "someone you considered yourself to be in a

relationship with"), (2) how familiar this person was, (3) how long the participant had known this partner before having sex, and (4) the percentage of all sexual intercourse occasions with this partner in which a condom was used.

Results for the "most recent sexual relationship" questions are shown in Table VII. Intervention and control participants did not differ significantly on whether their most recent partner was a casual or a regular partner; 68.8% of controls and 70.0% of intervention participants viewed their most recent sexual partner as a regular partner.

When asked how familiar the most recent partner was to the participant, participants could select from a list of choices, ranging from (1) "a stranger/someone you had just met" to (6)

TABLE VII

CHARACTERISTICS OF MOST RECENT SEXUAL RELATIONSHIP

Characteristic	Control Group ($N = 64$)	Intervention Group ($N = 80$)	
Type of partner			$\chi^2 = 0.03$
Regular	68.8%	70.0%	
Casual	31.2%	30.0%	
Familiarity of partner			$\chi^2 = 14.01^a$
A stranger/someone you had just met	17.2%	3.7%	
A casual acquaintance	6.3%	12.5%	
A friend	3.1%	11.3%	
Someone you really liked but not a girlfriend/boyfriend	12.5%	20.0%	
Your steady girlfriend/boyfriend	54.7%	42.5%	
Your fiance(e)	6.2%	10.0%	
Length of time the participant knew partner before having sex			$\chi^2 = 6.42$
<1 week	25.0%	16.2%	
1–3 weeks	21.9%	12.5%	
4–6 weeks	17.2%	17.5%	
7–12 weeks	18.7%	27.5%	
3–6 months	7.8%	16.3%	
≥7 months	9.4%	10.0%	
Percentage of time participant used a condom with this partner	72.0%	80.8%	$t = 1.44$

All analyses are based only on participants ($N = 144$) who were sexually active in the past 6 months.
$^a p < 0.05$.

"your fiance(e)." These data are presented in Table VII. A χ^2 test was used to determine if there was an overall difference between the intervention and control groups on partner familiarity. A significant overall difference between the two groups was found [χ^2(5, N = 144) = 14.01, p < 0.05]. Individual χ^2 tests (with Yates' correction) were also performed to compare the specific percentages of the experimental groups at each level of partner familiarity; Fisher's exact tests were used when any cell size was less than five. Only one significant difference was found: a higher percentage of the control group (17.2%) than the intervention group (3.7%) described their most recent partner as "a stranger/someone you had just met" [χ^2(1, N = 144) = 5.86, p < 0.05].

Participants were asked the open-ended question, "How long did you know this person before having sex?" regarding their most recent sexual partner. Responses were coded into the six categories, ranging from (1) less than 1 week to (6) 7 months or longer (Table VII). A χ^2 test revealed no overall difference between the intervention and control groups on this variable [χ^2(5, N = 144) = 6.42, p > 0.05].

Regarding their most recent sexual partner, participants were asked, "Of all the times you had sexual intercourse with this partner in the past 6 months, what percentage of the time did you use a condom?" The average percentage of condom use was 72.0% for the control group and 80.8% for the intervention group (Table VII). Although the trend was in the expected direction (i.e., the intervention participants reported a higher rate of condom use), this difference was not statistically significant [t(143) = 1.44, p = 0.15].

Alcohol Consumption

Four interview questions asked about alcohol consumption: "Did you drink any alcohol at all in the past 30 days?"; "In the past month, approximately how many drinks (total) did you consume?"; "In the past month, on how many days did you drink any alcohol?"; and "In the past 30 days, on how many days did you consume five or more drinks on the same occasion?" These results are shown in Table VIII. The vast majority of participants in both the intervention group (91.7%) and the control group (93.6%) reported drinking some alcohol in the past 30 days. The mean number of drinks consumed in the past 30 days was 27.09 drinks for the intervention group and 23.71 drinks for the control group. The number of days in the past 30 days in which any alcohol was consumed was 6.71 days for the intervention group and 6.55 days for the control group; the number of days in which five or more drinks were consumed was 2.57 days for the intervention group and 3.05 days for the

control group. No differences between the groups were found on any of the alcohol consumption variables.

STD Diagnosis

In the interview, participants were asked, "In the past 12 months, have you been diagnosed with any sexually transmitted disease?" Less than 3% of the participants overall (2.8%) answered "yes" to this question. Although a higher percentage of intervention (4.2%) than control participants (1.3%) reported being diagnosed with an STD in the past year, this difference was not significant [Fisher's exact test, χ^2(1, N = 176) = 0.50, p > 0.05]. The STDs that the five participants reported were nongonococcal urethritis (n = 3), Chlamydia (n = 1), and crabs (n = 1). No participant reported being diagnosed with HIV. Three-quarters of the MSGs (75.4%) reported that they had been tested for HIV within the past year; similar proportions of intervention and control participants (79% vs. 74%) stated that they had been tested for HIV in the past year.

Discussion

The purpose of this study was to determine whether a behavioral intervention known as SHIP would have a significant impact on MSGs' sexual behavior 1 year later. To determine the impact of the program, 1-year follow-up interviews were conducted with a group of MSGs who received SHIP (intervention group) and with a quasi-control group of MSGs who did not receive SHIP.

The results revealed that the intervention and control groups did not differ on whether they had had sex in the past year, on the number of sexual partners they had had in the past year, or on the number of casual partners they had had in the past year. However, the groups did differ significantly on rates of condom use during the past year. The intervention participants had used condoms a greater percentage of the time than the control participants, and the percentage of Marines who used condoms consistently (defined as 100% of the time) was significantly higher in the intervention group than in the control group.

The fact that condom use was greater in the intervention group than in the control group is an encouraging finding. However, this result needs to be put into perspective. The difference between the two groups on condom use for the past year was modest: 86% for the intervention participants and 75% for the controls. The average rate of condom use for the control MSGs was quite high (75%); a previous study involving a different sample of MSGs using questionnaires instead of interviews

TABLE VIII

MEANS ON ALCOHOL CONSUMPTION VARIABLES

	Control Group (N = 78)	Intervention Group (N = 96)	
Percentage of participants who drank any alcohol, past month	93.6%	91.7%	$\chi^2 = 0.23$
Number of drinks consumed, past month	23.71	27.09	$t = -1.07$
Number of days the participant drank any alcohol, past month	6.55	6.71	$t = -0.22$
Number of days the participant had five or more drinks on same occasion, past month	3.05	2.57	$t = 0.81$

N = 174. Two participants declined to answer the alcohol questions. None of the comparisons between the control and intervention groups were statistically significant.

found a nearly identical rate of condom use for the past year (74%) among MSGs who had not taken part in an STD/HIV intervention.[20] In light of ceiling effects and the fact that most behavioral interventions have used populations with much lower baseline rates of condom use, it is somewhat surprising that SHIP participants had a higher rate of condom use than Marines who were not exposed to SHIP. It should also be noted that most published studies in which HIV behavioral interventions have been evaluated have used much shorter follow-up periods (typically 1–3 months) than the 12-month follow-up used in the present study. Assuming that the effects produced by behavioral interventions tend to fade over time, it is somewhat surprising that the present study still showed an impact 12 months later.

In general, the MSGs in this study, whether intervention participants or controls, had a fairly high level of condom use. It is likely that this was attributable in part to the fact that MSGs have equal and very easy access to free condoms through a military supply system. It should also be noted that control participants (who went through the MSG school before the implementation of SHIP) received a small amount of STD/HIV training during MSG training. Specifically, they received 50 minutes of classroom instruction (lecture with slides) on the topics of STDs, HIV, and safe sex.

A number of other interesting findings emerged from this study. The intervention participants were more likely than the control participants to report that they had had a discussion with a sexual partner about their partner's sexual history in the past 6 months and were more likely to report that they had had a discussion with a partner about their partner's STD/HIV status. This suggests that the intervention may have had an impact on the participants' interpersonal behaviors, making them more inclined to have discussions about their partners' level of risk for STDs/HIV. However, it is also possible that this result was caused by experimenter expectancy effects. Intervention participants may have felt more social pressure than control participants to report that they had had "appropriate discussions" with their partners.

This study also found that control participants were significantly more likely than intervention participants to describe their most recent sexual partner as "a stranger/someone you had just met" as opposed to someone with a greater degree of familiarity (e.g., "a friend," "someone you really liked but not your girlfriend/boyfriend"). Yet, no difference was found between the two groups in the number of sexual partners they had had in the past 6 months whom they had known for less than 1 week at the time they had sex. Viewing these results in combination leads us to conclude that the former difference may have been caused by demand characteristics or experimenter expectancy effects. The intervention participants knew that they had participated in SHIP and might have felt social pressure to describe their partners at a high level of familiarity.

Mixed results were obtained regarding alcohol and unsafe sex. Intervention participants reported a significantly lower percentage of sexual intercourse experiences that took place after drinking alcohol compared with controls. This suggests that SHIP may have caused participants to become more cautious about having sex after drinking, which was one of SHIP's goals. Yet, intervention participants were also more likely than con-

trols to agree that alcohol may have caused them to take more chances sexually than they normally would have taken. In addition, no differences between the groups were found regarding alcohol consumption. Our interpretation of these data is that the Marines' actual drinking behavior (i.e., consumption) did not change as a result of the intervention but that the intervention raised the awareness of the intervention participants regarding alcohol's impact on their behavior.

A number of limitations of this study should be noted. The most serious limitation is that the study did not include a true control group. Because the MSG Battalion Headquarters wanted all MSG students to receive the SHIP course, it was not politically feasible to hold out a group of MSGs who would not get the training. Although a true control group was not used, great care was taken to obtain the closest approximation possible to a true control group, and there were no significant differences between the intervention and quasi-control participants on any of the demographic variables. However, because of the disparity in the experiences of the two groups, the intervention participants may have felt more social pressure to give socially desirable responses. A second major limitation of the study was the lack of baseline data. All outcome comparisons were simple comparisons between the intervention group and the control group at the 1-year mark. Without baseline measures of sexual behavior, it is difficult to conclude definitively that the intervention led to changes in sexual behavior over time. Another limitation of the study is that it relied exclusively on self-reports of sexual and psychosocial information. Self-report data of any type are susceptible to multiple sources of bias and measurement error; self-report data about sexual behavior are considered especially susceptible to these problems.[21] A final limitation is that we do not know how well the results would generalize to other military and/or civilian populations. Future research should test the effectiveness of SHIP in other populations.

The strengths of this study should also be noted. This is one of the first studies to demonstrate the effectiveness of an STD/HIV intervention in a U.S. military population across an extended time period (1 year). Another strength of the study was the high response rate obtained in the interviews (93%). Response rates from other studies that have used interviews to obtain information about sex and other sensitive topics have typically ranged from 55% to 80%.[22-24] This fact, coupled with the fact that all MSGs who went through the MSG training program between February 1998 and February 1999 participated in SHIP (because it was part of the MSG school curriculum), means that the data are likely to be very representative of the MSG population as a whole and not appreciably affected by "volunteer bias." An additional strength is the fact that the intervention was tailored to the MSGs. A final strength of this investigation was its inclusion of measures of interpersonal behaviors (e.g., whether the participant had discussed condoms with a partner), which may have an important effect on risky sexual behaviors.

Additional research is needed to determine how SHIP can be strengthened. Implementation of a SHIP "booster session" for MSGs who have been out of MSG school and at their first duty stations for a few months is one step that could be taken to strengthen the effects of SHIP. Consideration might also be given to adding a module to SHIP that focuses on helping indi-

viduals develop concrete interpersonal skills that facilitate the negotiation of condom use and safer sex in general. In addition, because earlier research[20] found that participants' attitudes toward condoms tended to become less positive immediately after SHIP (although their intentions to use condoms also became stronger), it might be worthwhile to add a module to SHIP specifically designed to improve attitudes toward condoms. This approach has been found to be promising in other research.[5,25]

In conclusion, the results of this study suggest that SHIP had a significant impact on MSGs' sexual behavior 1 year after the intervention, by leading to a significant increase in rates of condom use. The increase in the MSGs' rate of condom use was significant but not large in magnitude. Additional research is needed to further refine and strengthen SHIP, to transition SHIP to other populations, and to develop other behavioral interventions tailored to U.S. military populations.

Acknowledgments

References

1. HIV/AIDS Surveillance Report, 11 (No. 1) Atlanta, GA. Centers for Disease Control and Prevention, 1999.

2. What Intervention Studies Say about Effectiveness: A Resource for HIV Prevention Community Planning Groups. Washington, DC, Academy for Educational Development, 1996.

3. Holtgrave DR, Qualls NL, Curran JW, Valdiserri RO, Guinan ME, Parra WC: An overview of the effectiveness and efficiency of HIV prevention programs. Public Health Rep 1995; 110: 134–46.

4. Oakley A, Fullerton D, Holland J: Behavioural interventions for HIV/AIDS prevention. AIDS 1995; 9: 479–86.

5. Ploem C, Byers ES: The effects of two AIDS risk-reduction interventions on heterosexual college women's AIDS-related knowledge, attitudes and condom use. J Psychol Hum Sexuality 1997; 9: 1–24.

6. Sikkema KJ, Winett RA, Lombard DN: Development and evaluation of an HIV-risk reduction program for female college students. AIDS Education and Prevention 1995; 7: 145–59.

7. Jemmott JB, Jemmott LS, Fong GT: Reduction in HIV risk: associated sexual behaviors among black male adolescents. Effects of an AIDS prevention intervention. Am J Public Health 1992; 82: 372–7.

8. St. Lawrence JS, Brasfield TL, Jefferson KW, Alleyne E, O'Bannon RE, Shirley A: Cognitive-behavioral intervention to reduce African-American adolescents' risk for HIV infection. J Consult Clin Psychol 1995; 63: 221–37.

9. Kelly JA, St. Lawrence JS, Hood HV, Brasfield TL: Behavioral intervention to reduce AIDS risk activities. J Consult Clin Psychol 1989; 57: 60–7.

10. Peterson JL, Coates TJ, Catania JA, et al: Evaluation of an HIV risk reduction intervention among African-American homosexual and bisexual men. AIDS 1996; 10: 319–25.

11. Rotheram-Borus MJ, Koopman C, Haignere C, Davies M: Reducing HIV sexual risk behaviors among runaway adolescents. JAMA 1991; 266: 1237–41.

12. Belcher L, Kalichman S, Topping M, et al: A randomized trial of a brief HIV risk reduction counseling intervention for women. J Consult Clin Psychol 1998; 66: 856–61.

13. Hobfoll SE, Jackson AP, Lavin J, Britton PJ, Shepherd JB: Reducing inner-city women's AIDS risk activities: a study of single, pregnant women. Health Psychol 1994; 13: 379–403.

14. Kalichman SC, Carey MP, Johnson BT: Prevention of sexually transmitted HIV infection: a meta-analytic review of the behavioral outcome literature. Ann Behav Med 1996; 18: 6–15.

15. Interventions to prevent HIV risk behaviors. National Institutes of Health Consensus Statement Online, 15, 1–41, February 11–13, 1997. Available at http://consensus.hiv.gov/. Accessed May 5, 1998.

16. Malone JD, Hyams KC, Hawkins RE, Sharp TW, Daniell FD: Risk factors for sexually transmitted diseases among deployed US military personnel. Sex Transm Dis 1993; 20: 294–8.

17. Boyer CB, Shafer MA, Shaffer RA, et al: STD/HIV Prevention in Young Military Men: Evaluation of a Cognitive-Behavioral Skills Building Intervention. Technical report 97-15. San Diego, CA, Naval Health Research Center, 1997.

18. Fisher JD, Fisher WA: Changing AIDS-risk behavior. Psychol Bull 1992; 111: 455–74.

19. Fisher JD, Fisher WA, Williams SS, Malloy TE: Empirical tests of an information-motivation-behavioral skills model of AIDS preventive behavior. Health Psychol 1994; 13: 238–50.

20. Booth-Kewley S, Minagawa RY, Shaffer RA, Gilman PA, Brodine SK: Evaluation of an STD/HIV Intervention Program among Marine Security Guards. Technical report 99-23. San Diego, CA, Naval Health Research Center, 1999.

21. Weinhardt LS, Forsyth AD, Carey MP, Jaworsky BC, Durant LE: Reliability and validity of self-report measures of HIV-related sexual behavior: progress since 1990 and recommendations for research and practice. Arch Sex Behav 1998; 27: 155–81.

22. Choi K, Catania JA: Changes in multiple sexual partnerships, HIV testing, and condom use among U.S. heterosexuals 18 to 49 years of age, 1990 and 1992. Am J Public Health 1996; 86: 554–6.

23. Fournier L, Kovess V: A comparison of mail and telephone interview strategies for mental health surveys. Can J Psychiatry 1993; 38: 525–33.

24. Tourangeau R, Smith TW: Asking sensitive questions: the impact of data collection mode, question format, and question context. Public Opinion Quarterly 1996; 60: 275–304.

25. Tanner W, Pollack R: The effect of condom use and erotic instructions on attitudes toward condoms. J Sex Res 1988; 25: 537–51.

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14. ABSTRACT (maximum 200 words)
Although a substantial number of studies have been conducted to evaluated the impact of various human immunodeficiency virus (HIV) prevention programs, most of them have focused on civilian populations. There is a clear need to develop and evaluated sexually transmitted diseases (STD)/HIV prevention programs designed specifically for U.S. military populations. The object of the present study was to determine whether a behavioral intervention known as the STD/HIV Intervention Program (SHIP) would have a sustained positive impact on the behavior of a sample of Marines. A 1-year follow-up telephone interview was administered to (1) Marines who participated in the SHIP course (intervention group), (2) a quasi-control group of Marines who were not exposed to SHIP course. The intervention and control groups differed significantly in the percentage of the time they had used condoms during the past year. The intervention participants reported using condoms a greater percentage of the time than the non-participants.

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