Reducing Risk of Sexually Transmitted Disease (STD) and Human Immunodeficiency Virus Infection in a Military STD Clinic: Evaluation of a Randomized Preventive Intervention Trial

Pamela R. Jenkins, Richard A. Jenkins, Ellen D. Nannis, Kelly T. McKee, Jr., and Lydia R. Temoshok

Three single-session preventive interventions for reducing sexually transmitted disease (STD) and human immunodeficiency virus infection risk behaviors were evaluated with a sample of 400 men who attended a large military STD clinic. A quasi-experimental, pre-evaluation/postevaluation design was used, comparing standard clinic care alone versus standard care combined with 1 of 3 experimental interventions: health-risk appraisal, interactive video, and targeted situational behaviors. Questionnaire data were collected at baseline and during follow-up visits at 2 weeks and 2 months. Findings indicated that the health-risk appraisal and interactive video increased adherence with clinic recommendations to abstain from sex (χ²[3199] = 19.67; P < .001) and increased readiness to change “risky” partner-selection behavior (χ²[2194] = 6.42; P < .04). Follow-up data suggested that STD-related risk behavior was particularly resistant to change but that the single-session intervention had some impact, which could be viewed as a “priming” effect that enhances multisession interventions.

Sexually transmitted diseases (STDs) provide an important focus for HIV infection prevention and control because of the

Received 24 March 1999; revised 25 August 1999; electronically published 20 April 2000.


This research was conducted in compliance with the Standards for Human Subjects of the American Psychological Association and received review and approval from the committees for the protection of human subjects of the WOMACK Army Medical Center and the Walter Reed Army Institute of Research (WRAIR).

Articles contained in this symposium represent work conducted under Research Projects RV-56 (“Surveillance and Analysis of Sexually Transmitted Disease Patterns at Fort Bragg, NC”) and RV-81 (“Prevention of Exposure to HIV and Other Sexually Transmitted Diseases in a Seronegative Military Population: A Comparative Study of the Safety and Efficacy of Intensive STD/HIV Preventive Interventions”), supported by Cooperative Agreement DAMD 17-93-V-3004 between the US Army Medical Research and Materiel Command and the Henry M. Jackson Foundation for the Advancement of Military Medicine.

The views and opinions expressed here are those of the authors and do not necessarily reflect the officials policy or position of the US Army, the US Department of Defense, or the Henry M. Jackson Foundation.

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Clinical Infectious Diseases 2000;30:730–5

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Clinical Infectious Diseases 2000;30:730–5

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risky partners; (2) condom use; (3) perception of risk; (4) readiness to change behavior; and (5) risky situations (e.g., the use of alcohol in conjunction with sex). The interventions were designed to fit easily into a clinic routine (i.e., they required little time, space, and equipment), to incorporate military culture (e.g., use military examples and jargon), and to use behavioral norms based on a military population. The use of local norms and of existing health care systems have been noted as important components of any successful HIV/STD intervention [5, 15, 16].

Patients and Methods

A pre-evaluation/postevaluation group comparison design was used. Participants were randomly assigned to 1 of 3 interventions, delivered in tandem with “standard” clinical care, or to standard clinic care only. Baseline data were collected at participants’ clinic visits before assignment to an intervention; posttest data were collected 2 weeks later, when patients returned for their normal follow-up visits, and again at 2 months after baseline.

A 2-week follow-up visit needed to occur 10–20 days after baseline, and a 2-month follow-up visit needed to occur 42–78 days after baseline. The decision to use these intervals results from a series of analyses that indicated that persons who fell outside these criteria and those who fell outside them differed at 2 weeks with respect to marital status, alcohol consumption, willingness to refuse sex, and readiness to change their behavior; and at 2 months, they differed with respect to their willingness to refuse sex, fear of becoming HIV-infected, and military rank. These differences appeared numerous and substantively important enough to justify limiting follow-up analyses to those patients whose follow-up visits occurred during the specified range for the follow-up period of interest.

In general, rates of follow-up were high despite frequent problems posed by duty schedules and leaves of absence: 73.2% of the sample was available at 2 weeks, and 48.5% was available at 2 months. There were no significant differences in attrition among groups at 2 weeks or 2 months.

Patients. Patients were 400 men who were initially seen from December 1994 through January 1996 at the Womack Army Medical Center’s Epidemiology and Disease Control Clinic (EDC) at Fort Bragg, North Carolina. Because of differences between the sexes with respect to STD risk factors and in military culture [17], we chose to focus on only men in this first study, because their greater number in the military would allow us to complete the study in a timely fashion. The sample size was based on a power analysis that assumed that the rate of reoccurrence of STDs would match previous prevalences over a 2-month period; the rate we noted was about half that observed during the year before the study.

Patients were recruited from consecutive active duty personnel who (1) presented with symptoms of acute urethritis; (2) were not known a priori to be HIV-seropositive; (3) had sufficient active duty time to complete the study (i.e., 2 months before their discharge or transfer date); and (4) gave written informed consent. Urethritis was chosen because it represented the most reliable condition associated with a diagnosis of STD within our sample. HIV-infected individuals were excluded from the study because the additional exposure to risk prevention education that HIV-positive individuals undergo in the military might have confounded the results of the current study.

A total of 94 patients declined to join the study; however, there were no significant demographic differences between those who declined to join the study and study patients (see [18] for more detailed analyses). Patients were randomized to 1 of the 4 study conditions, with assignment based on a random number table. This resulted in slightly unequal sample sizes at baseline: STD/HIV risk appraisal, n = 99; targeted situational behavior, n = 101; interactive video disk, n = 103; and control, n = 97.

Measures. Self-administered questionnaire measures were used to collect behavioral data. This method has been found to be reliable and to generally yield greater disclosure of information than other survey modalities [19]. A description of each measure and the points at which they were determined follows.

Questionnaire data included demographics (age, sex, ethnicity, marital status, rank unit, and educational level, all determined at baseline), STD history (baseline), and risk factors (baseline, 2 weeks, and 2 months). The risk assessment items were adapted from the Army-Wide AIDS/HIV survey, administered to a representative probability sample of US Army personnel in 1991–1992 [20]. The current questionnaire asked participants about the frequency of various STD/HIV risk behaviors, including sex with partners who had an increased risk of being HIV-infected, consistent condom use with various types of partners, and sharing injection-drug equipment. We also assessed risky sexual practices (e.g., sexual bingeing), associated risk practices (e.g., use of beer, wine, or liquor within 2 h of or during sex and meeting new partners in high-risk venues such as bars and parks), additional partner characteristics (e.g., civilian or military), sources of social influence and attitudes (e.g., importance of peer approval), perceived HIV infection vulnerability, and whether or not the individuals carried condoms (this was thought to indicate whether condoms would be readily available for use).

Finally, biological risk factors were assessed (e.g., nonmenstrual bleeding during sex and having partners with genital warts or sores) on the basis of findings from previous investigations [21, 22]. These were infrequent over time for evaluation in relation to the interventions, although they were examined in relation to baseline data (see [18]).

Readiness for changing behavior with respect to condom use, high-risk–partner selection, and alcohol use concomitant with sex were measured (at baseline, 2 weeks, and 2 months) by 5-point Likert-type scales, adapted from Prochaska and DiClemente [23]. Each level is considered to represent a different stage in the process of change. The stages are hierarchical, although there is no assumption about whether the intervals between stages are even [23]. Level 1 represented no intention of changing behavior; level 2 indicated thinking about changing behavior; level 3 indicated some (although inconsistent) changing behavior; level 4 indicated consistent change, adopted recently; and level 5 represented maintenance of changed behaviors (i.e., adoption and maintenance of change for a period of time). These readiness factors were assessed with reference to the previous 6 months (baseline assessment), 2 weeks (2-week assessment), and 2 months (2-month assessment).

Adherence with clinic treatment recommendations (at 2 weeks and 2 months) was assessed by an interview at 2 weeks and in-
to identify ways in which they put themselves at risk (e.g., having participation in postdeployment ªcelebrations.º Participants were asked anonymous, or SWs), and having sex while on deployment or partici-

 beings commonly incorporated into the scenarios included choos-

 STD-risk-relevant attitudes and behavioral intentions [24].

 Targeted situational behavior (TSB) intervention. The TSB in-

 spective of clinic records. Specifically, at the 2-week follow-up visits, we noted whether patients had (1) returned for the test for cure, (2) notified partners of their STD diagnosis, and (3) abstained from sexual activity for 2 weeks.

 Intervention conditions. Interventions were designed specifically for this study, with no a priori assumptions about their relative effectiveness. Interventions were designed to fit easily into clinic routine and therefore could take no more than 20 minutes.

 STD and HIV health-risk appraisal (HRA). HRAs are widely used in military settings and thus provide a familiar format for this sample. The HRA intervention began with the administration of the risk-assessment portion of the behavioral questionnaire (see Measures). Computerized scoring generated individualized graphic representations of an individualized risk profile and specific feedback messages. The results and recommendations were given to each patient along with problem-focused counseling, which was provided according to a standard protocol by a civilian member of the study team. The risk-assessment questionnaire used to generate the feedback was used as an assessment instrument for all study participants; however, only those randomized to the HRA received feedback in graphic form and HRA-based counseling.

 Interactive video disk (IAVD). Interactive videos are media tools that allow meaningful interaction between the viewer and the video screen; thus, they can provide tailored feedback to participants based on their responses to questions in the video. This technology has shown itself to be acceptable to patients with STDs at Fort Bragg and, in the short run, efficacious for altering their HIV/STD-risk-relevant attitudes and behavioral intentions [24].

 The IAVD material selected was from a series of interactive videos developed for the US Military by the Center for Interactive Media in Medicine/Center for Medical Education Technology, in Bethesda, Maryland. The selected material addressed issues defined by previous research as related to HIV exposure risk behavior in military samples [20]. These findings indicated the need for interventions that foster self-evaluation of risk-relevant behavior (e.g., unprotected penetrative intercourse) and provide information about alternatives to risky practices. Participants completed the IAVD on their own, although a civilian member of the study team was available to answer questions or to clarify issues.

 Results

 The composition of the sample is detailed elsewhere [18]. In brief, participants tended to be relatively young (median age, 23 years; range, 18–43 years) and black or white; their was a skew toward high school-level education and the lower enlisted military ranks. Most participants were single and lived alone or with someone who was not a spouse or other type of sexual partner.

 There were no significant differences at baseline between the experimental conditions across demographic, behavioral, attitudinal, and HIV knowledge variables, with 2 exceptions: the IAVD condition was associated with fewer blacks (49%, vs. 61%–69% for other conditions), and general knowledge about STD/HIV was higher in the control group, in which the fewest number of participants had ≥1 error on an assessment of HIV knowledge (20%, vs. 31%–45% in other conditions).

 There were no significant demographic, behavioral, attitudinal, or HIV knowledge differences between the experimental conditions at either follow-up visit, with 1 exception. The exception was race/ethnicity, for which there were differences in proportion similar to those observed at baseline.

 Baseline risk characteristics. Baseline risk behavior is detailed elsewhere [18]. In brief, most participants reported ≥1 lifetime partners with whom they had vaginal, oral, or anal sex. Almost two-thirds (62.3%) reported having ≥1 high-risk partners during the past year. High-risk partners included one-

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Table 1. Risk behavior in relation to randomly assigned experimental condition at the 2-week follow-up of a cohort of patients at a military STD clinic.

<table>
<thead>
<tr>
<th>Risk behavior</th>
<th>Patients reporting behavior per condition group, % (n = 293)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HRA</td>
</tr>
<tr>
<td>Sex with partner(s)</td>
<td></td>
</tr>
<tr>
<td>0 times</td>
<td>82.2</td>
</tr>
<tr>
<td>&gt;1 time</td>
<td>17.8</td>
</tr>
<tr>
<td>Meeting new sex partners</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4.1</td>
</tr>
<tr>
<td>No</td>
<td>95.9</td>
</tr>
</tbody>
</table>

NOTE. HRA, health-risk assessment group; IAVD, interactive video disk group; TSB, targeted situational behavior group.

a No. of partners with whom they had vaginal, oral, or anal sex.

b Going out for the express purpose of meeting new sex partners.

discussion}

Table 2. Responses of a cohort of patients at a military STD clinic at 2-week follow-up concerning whether condoms were always carried or available.

<table>
<thead>
<tr>
<th>Response</th>
<th>Patients per group, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HRA</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>19.2</td>
</tr>
<tr>
<td>Somewhat disagree</td>
<td>8.2</td>
</tr>
<tr>
<td>Somewhat agree</td>
<td>28.8</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>43.8</td>
</tr>
</tbody>
</table>

NOTE. HRA, health-risk assessment group; IAVD, interactive video disk group; TSB, targeted situational behavior group.

night stands, SWs, anonymous partners, HIV-positive partners, and partners who injected drugs.

Treatment efficacy. In addition to comparisons of treatment effects to the control condition, treatment effects were compared among interventions to assess whether any 1 intervention format was better than the others.

Behavioral risk. There were significant differences in the number of partners among the experimental conditions at the 2-week follow-up visit (χ²[3293] = 10.22; P < .02; table 1). Those randomized to the HRA and IAVD conditions were less likely to have partners at 2 weeks than were those randomized to the TSB intervention or control condition. No significant differences were present at the 2-month follow-up. There were no significant differences among conditions with respect to whether patients reported 1 or more high risk partners at the 2-week or 2-month follow-up visits.

Condom use and availability. There was a significant difference at the 2-week follow-up regarding whether condoms were always carried or otherwise available (χ²[9293] = 18.58; P < .04; table 2). TSB intervention participants, compared with those assigned to other conditions, were less likely to agree (strongly or somewhat strongly) that they always carried condoms or otherwise made them available. No such differences were noted at 2 months. The effect of intervention on consistency of condom use specifically with risky partners could not be evaluated, because the available sample of inconsistent condom users was insufficient for meaningful analysis at both follow-up visits.

Meeting new partners. Because of the need for sexual abstinence due to the STD diagnosis, meeting new partners at the 2-week follow-up was defined as risk behavior. There was a significant difference with respect to whether the participant had gone out to meet new partners at the 2-week follow-up (χ²[3292] = 8.65; P < .03). HRA and IAVD participants were less likely to engage in this behavior than were those in the TSB intervention and control conditions (table 1); however, this result needs to be considered cautiously because of the small cell sizes.

Readiness to change behavior. We examined within-subject changes in “readiness for change” for each of the 3 behaviors in relation to baseline. This meant that those who were initially at lower levels of readiness to change had a greater range within which to move than those who were, at baseline, already at higher levels of readiness for change.

Condom use. Readiness to consistently use condoms more showed significant associations with experimental condition, although only at the 2-week follow-up. These included an association across all experimental conditions (χ²[6293] = 14.60; P < .02) and a general association (intervention vs. control) that favored the control group (χ²[2293] = 7.28; P = .03). Visual inspection of the frequencies from the latter analysis suggests that TSB and control patients were more likely to show increased readiness to change their condom-use practices toward more consistent use and were less likely to show decreases in readiness for change toward less consistent condom use than were those in the HRA and IAVD conditions (table 3).

Partner choice. Readiness to change partner choice (i.e., to choose less risky sex partners) had several significant associations with intervention at the 2-month follow-up. These included an association across all experimental conditions (χ²[6194] = 12.66; P < .05) and a general association with intervention versus control (χ²[2194] = 6.42; P < .04). The association across all experimental conditions indicated that HRA and IAVD participants were more likely to show at least a 1-stage increase in their readiness to change partner-selection practices at 2 months (compared with baseline) than were those in the TSB and control conditions (table 3).

Alcohol consumption. Readiness to change alcohol consumption in conjunction with sex had no associations with intervention at either follow-up period.

Adherence. Adherence was assessed at the 2-week follow-up and was evaluated with respect to 3 factors: (1) whether the patient returned for the test-of-cure visit, (2) whether the patient followed the partner-notification recommendations given by the clinic staff, and (3) whether the patient abstained from sexual intercourse during the preceding 2 weeks.

With regard to adherence to returning for the test of cure, there was a nonsignificant trend for experimental condition...
HRA and IA VD patients were more likely to return for the test of cure (80.8% and 76.3%, respectively) than those in the TSB and control groups (64.4% and 68.7%, respectively).

Adherence to partner-notification recommendations was not significantly related to experimental condition. Abstinence from sex during the period of active infection significantly varied across the experimental-condition groups ($\chi^2(3,199) = 19.67; P < .001$).

Abstinence was greatest in the IAVD group (98.3%) and least in the control group (73.9%), with the HRA and TSB groups intermediate (89.1% and 75.5%, respectively). When the control group was compared with the 3 intervention groups, the intervention participants as a whole were more likely to have abstained (88.2% vs. 73.9%; $\chi^2(199) = 5.12; P < .02$).

### Discussion

The modest effects evident here suggest that the HRA and IAVD interventions, compared with the control and TSB conditions, did have some short-term effects on increasing adherence with clinic recommendations to abstain from sex for 2 weeks during active STD infection. However, sexual risk behavior in this sample of sexually active, young, male military personnel appeared to be relatively stable over time. Such a pattern of modest change is not unusual in STD clinic samples [29] and limits the potential effectiveness of brief, single-session interventions. However, this study’s unusually high rate of return visits suggests that conducting multisession interventions would be feasible with this population.

A recent meta-analysis of the behavioral intervention literature suggested the superiority of multisession versus single-session interventions [9]. The CDC-sponsored project RESPECT [4] and the National Institute of Mental Health’s Multisite HIV Prevention Trial [5] provide models of successful, multiple-session interventions in STD clinic settings that would be compatible with the behavior-change principles used in the present investigation. More modest success has been shown by a San Francisco–based project involving STD clinic attendees [3].

The findings for those participating in the interventions indicated increases in readiness to change key risk factors. Because increases in readiness to change risky sexual behavior could be prerequisites for actual behavioral change [23], the interventions here may be viewed as potentially successful primers for change, which might then be enhanced by a longer-term intervention. The HRA would be particularly useful for identifying those who need more intensive interventions at the time of initial contact with the clinic; this early identification could be helpful for preventing recidivism [5] and for further targeting the interventions.

The HRA algorithm could be modified to include variables that have been associated with greater resistance to behavioral change [30]. Among other factors, these include being slightly older, having more risky partners, having had sex within 2 h of alcohol use, wanting to be accepted by one’s military peers, and having sex while on leave.

The short-term effects of the HRA and IAVD for reducing STD/HIV exposure-risk factors suggest that they merit further investigation. The interventions are relevant to the military culture and easily integrated in the existing system of care and counseling. Moreover, the findings suggest they could be adapted to a multisession intervention, which might have more impact. Their relatively simple formats minimize the need for costly, highly trained personnel, increasing their cost-effectiveness for the military.

Although the present data were derived from a military sample, these interventions could be adapted for wider use in other public health settings, particularly for populations whose situations or sociodemographics resemble those in the military (i.e., populations that are young, sexually active, predominantly male, of heterogeneous ethnicity, and may travel or be away from hometown stabilizing effects).

### Acknowledgments

We thank the clinic attendees who participated in this research. We also express appreciation to Robin Gardner, Tor-Lai Wong, and Ayah Johnson for statistical support; Susan Blake, Erica Sharp-Breslau, and Phil Renzullo for their important developmental work on this project; Cathy Richards, Michael Miller, Bob Olyer, Vardman Gann, Jackie...
Devoted to the software for the HRA intervention.

Ed Hutchins, with Healthier People, Inc. (Decatur, GA), who developed the software for the HRA intervention.

References


