An Individually Tailored Intervention for HIV Prevention: Baseline Data From the EXPLORE Study

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Objectives. We describe the intervention tested in EXPLORE, an HIV prevention trial aimed at men who have sex with men (MSM), and test the empirical basis of the individually tailored intervention.

Methods. Data on participants' self-efficacy, communication skills, social norms, and enjoyment of unprotected anal intercourse were examined in relation to sexual risk. Combinations of these factors, together with alcohol use and noninjection drug use, were also examined.

Results. The individual factors examined were associated with sexual risk behavior. The cohort was shown to be heterogeneous in regard to the presence of combinations of these risk-related factors.

Conclusions. Baseline data from the EXPLORE study support the efficacy of the individually tailored intervention used. (*Am J Public Health.* 2003;93:933–938)

Evidence indicates that HIV incidence rates are rising among men who have sex with men (MSM),[1–3] that prevalence rates remain high in large urban areas,[4–7] that sexually transmitted disease rates among MSM have risen,[8–10] and that the prevalence of sexual risk behaviors, specifically unprotected anal intercourse, has increased.[11] A recent meta-analysis of HIV interventions designed for MSM revealed that behavioral interventions tested to date have reduced the number of episodes of unprotected intercourse but that effects have waned over time and have not been consistent across studies.[12] Among the factors contributing to the success of interventions are the use of interventions of longer duration and a focus on interpersonal skills related to reducing risk behavior, including the ability to communicate and discuss risk status and possession of the skills necessary to negotiate safer behaviors.

Research has associated individual, interpersonal, and situational factors with sexual risk taking among MSM and has thus offered potential targets for intervention. These factors include greater pleasure in or enjoyment of risk-related sexual behavior, negative mood states, communication difficulties, social norms encouraging misperceptions of risk and risk taking, use of alcohol or recreational drugs, and life events and environments that are catalysts for risk taking.[13,14]

Elsewhere in this issue, Koblin et al.[15] describe the demographics and prevalence of HIV-related risk behavior in a large, multicity, multiethnic cohort of MSM enrolled in EXPLORE, a randomized clinical trial designed to evaluate the impact on HIV incidence rates of a 10-session, individually delivered cognitive–behavioral intervention followed by quarterly maintenance sessions. Here, using baseline data from the EXPLORE cohort, we test the empirical foundation of the intervention's design: both the salience of the factors targeted by the intervention as correlates of self-reported risk and the need to individualize delivery of the intervention because of the heterogeneous clustering of factors among at-risk men.

THE EXPLORE INTERVENTION

The EXPLORE behavioral intervention assumes that different core factors are associated with risk among different MSM and that interventions need to be tailored to address the factors most pertinent to a given individual. The intervention addresses these factors by integrating the approaches of (1) motivational interviewing,[16–19] which addresses behavior change in areas in which individuals may be ambivalent; (2) the information–motivation–behavior model,[20–22] as a means of supporting training in the use of specific skills (e.g., communicating one's intentions to use a condom in different interpersonal contexts); and (3) social learning theory,[23] which focuses on the normative components of behavioral change.

The first 3 EXPLORE sessions were designed to establish rapport between the counselor and the individual in the context of identifying those factors most salient to unsafe sex and those most important for effective self-protective behavior. Using factors relevant to the individual, counselors selected pertinent modules for subsequent sessions (Table 1) from 6 domains drawn from the literature: (1) individual perception of risk behavior as examined through guided exploration of participants' sexual episodes; (2) attitudes and skills that facilitate or impair clear communication of risk limits; (3) beliefs about serostatus and its role in choosing whether to practice safer sex; (4) the role of substance use in promoting personal risk behavior; (5) aspects of partners, events, and places that are associated with risky behavior; and (6) planning for ongoing adherence to personal safety plans adopted in EXPLORE sessions.

Although this approach tailors selection of emphases and approaches to the individual, all modules used during the intervention were structured in accordance with guidelines provided in a detailed counseling manual.[24] The aim of the present study was to provide empirical validation for this individualized approach by examining the homogeneity or heterogeneity observed among the EXPLORE cohort in terms of the distribution of the factors under study and the association of these factors with self-reported risk behaviors.

TABLE 1—EXPLORE Counseling Modules: Core Theme and Session Focus

Module	Core Theme	Session Focus
Module 1	Being HIV negative and participating in EXPLORE	Participants state why they want to stay HIV negative; desire to remain negative is made explicit Mixed feelings about sex and risk are examined and normalized, beginning the focus on ambivalence[16,18,19]
Modules 2 and 3	Risk: What's acceptable to me? Crossing acceptable risk limits	Knowledge of risk factors for infection is assessed Personal relevance of risk reduction guidelines is examined through recent sexual episode narratives; individual attitudes regarding "acceptable" risk Discussion regarding pleasure of unprotected sex.[25,26]
Modules 4 and 5	Sexual communication: HIV status, spoken and unspoken messages	Attitudes and skills that facilitate or impair clear communication of risk limits[27]; communication about serostatus; the role of being part of a couple that employs risk limits or negotiated safety arrangements[28–31]
Module 6	Sex, drinking, and drugs	Impact of substance use on risk behavior[32,33]
Modules 7, 8, 9	Places and events as triggers Feelings and thoughts as triggers Partners as triggers	How personal, social, and environmental factors may trigger risky sex or preventive behavior Examination and skills training to manage risk when presented with · places where risky sex may occur[34–36] · life and social events that may encourage risk[37,38] · emotions and self-talk that cue risk taking[39,40] · partner characteristics that trigger risky sex
Module 10 and maintenance	Planning for maintenance Staying HIV negative	Planning for ongoing adherence to personal safety plans, including training for relapse prevention[41–43]; applying lessons from modules to changing life situations

METHODS

Study Population and Procedures

Details regarding study recruitment, baseline visits, data collection and management, and study monitoring are described by Koblin et al.[15]

Data Collection

Using audio computer-assisted self-interviewing (ACASI) technology, participants completed 22 items, scored on a 6-point Likert scale (*strongly disagree* to *strongly agree*), that measured self-efficacy regarding risk reduction, communication skills, and social norms about safer sex. Three items focusing on enjoyment of specific risk behaviors were prefaced with the following: "Please indicate how much you enjoy or think you enjoy doing the following activities with a man. Please answer for each sexual activity whether you have done it or not." These 3 items were as follows: (1) "You have insertive anal sex with your partner and you don't use a condom"; (2) "You have receptive anal sex with your partner and he does not use a condom"; and (3) "You have oral sex with your partner and you don't use a condom." Responses were scored on a 4-point Likert scale (*dislike very much, dislike, enjoy, enjoy very much*). ACASI was also used in collecting alcohol and drug use data and information on sexual risk behaviors.[15]

Statistical Analysis

The purpose of the analysis was to investigate the homogeneity or heterogeneity of domains associated with the intervention targets and their association with unsafe sexual practices. We first examined the distribution of the measures of self-efficacy for adopting safer sexual behaviors, communication skills, social norms about safer sex, and enjoyment of risk-related behaviors. Second, we assessed the distribution of combinations of these factors, and of alcohol and drug use. Finally, we evaluated the relationships of these factors, both separately and in combination, with sexual risk behaviors reported during the 6 months preceding baseline.

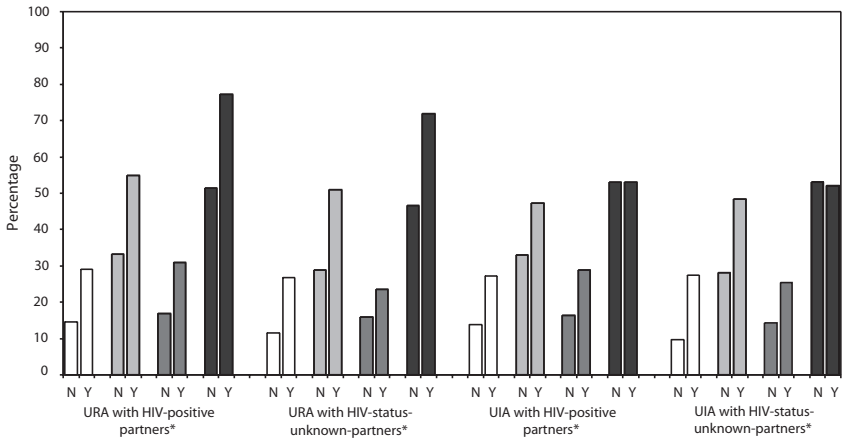
An exploratory factor analysis of the 22 items verified the presence of 3 factors in the baseline data: self-efficacy, communication skills, and social norms. These factors consisted of 9, 6, and 5 items, respectively. We constructed factor-based scales using the additive quantities of the scores for each item (based on the 1–6 scoring) and rescaled scores as 0 to 100, with lower scores reflecting lower self-efficacy, poorer communication skills, and weaker perceptions that social norms favor safer sex. Factor scores were dichotomized at 50, the midpoint of the range; scores below 50 represented disagreement with items reflecting safer behaviors.

In a similar fashion, we dichotomized enjoyment of risk-related behavior by combining the responses *enjoy somewhat* and *enjoy very much* and the responses *dislike somewhat* and *dislike very much.* To examine combinations of these factors, we coded each participant in terms of whether he had a low score (50 or less) on the factors, whether he enjoyed unprotected receptive anal sex (the riskiest behavior), whether he reported heavy alcohol use (defined as consumption of 4 or more drinks per day or 6 or more drinks per occasion), and whether he reported any noninjection drug use.

We used *z*-score statistics to evaluate the relationships between the factors and specific sexual risk behaviors. We compared the percentages of participants who reported enjoying (defined as "enjoy/enjoy very much") each of the 3 risk behaviors, using *z*-score statistics. Finally, using logistic regression, we examined the associations between a summary variable of high-risk sex and combinations of the factors in conjunction with

TABLE 2—Distributions of Factors: Self-Efficacy, Communication Skills, Safer Sex Norms, and Enjoyment of Unsafe Sex: EXPLORE, 1999–2001

Factor	No. (%)
Self-efficacy for safer sex score	
0–25	117 (2.8)
26–50	522 (12.5)
51–75	1467 (35.2)
76–100	2063 (49.5)
Communication skills score	
0–25	292 (7.3)
26–50	1095 (27.2)
51–75	1296 (32.2)
76–100	1342 (33.3)
Safer sex norms score	
0–25	138 (3.4)
26–50	588 (14.4)
51–75	1652 (40.4)
76–100	1710 (41.8)
Enjoyment of unprotected insertive anal sex	
Dislike	1055 (24.8)
Enjoy	3194 (75.2)
Enjoyment of unprotected receptive anal sex	
Dislike	1986 (47)
Enjoy	2239 (53)
Enjoyment of unprotected oral sex	
Dislike	2048 (48.1)
Enjoy	2209 (51.9)



Note. N = no report of risk behavior 6 months before baseline; Y = report of risk behavior 6 months before baseline; URA = unprotected receptive anal sex; UIA = unprotected insertive anal sex.
*$P < .0001$.

FIGURE 1—Percentages of men with low scores for self-efficacy for safer sex *(white bars)*, communication skills *(light gray bars)*, social norms *(dark gray bars)*, and enjoyment of unprotected receptive anal sex *(black bars)*, by sexual risk behaviors at baseline visit: EXPLORE, 1999–2001.

heavy alcohol use and noninjection drug use. High-risk sex was defined as receptive or insertive anal sex with an HIV-positive partner or a partner of unknown serostatus without use of condoms. The estimated regression coefficients produced were used to obtain the odds ratio associated with each combination.

RESULTS

One third of the cohort (Table 2) reported low communication skills, twice the percentage that reported low self-efficacy or weak social norms. Seventy-five percent of the participants reported enjoying insertive anal sex with their partner without using a condom, whereas 53% and 52% reported enjoyment of receptive and oral sex without using a condom, respectively.

The 3 factor scores and enjoyment of unprotected receptive anal sex were associated with sexual risk behaviors (Figure 1). Men reporting sexual risk behaviors were significantly more likely than men not reporting such behaviors to have low scores (50 or less) on the safer sex self-efficacy measure ($P < .0001$). Participants reporting unprotected anal sex (either receptive or insertive sex with partners of unknown or positive serostatus) were more likely to have low scores on the communication factor than were those who did not report such behavior ($P < .0001$). Men reporting unprotected anal sex were also more likely than those who did not report unprotected anal sex to have low scores on the social norms factor ($P < .0001$).

Finally, 72% of the men reporting that they had engaged in unprotected receptive anal sex with a partner of unknown HIV status also reported enjoyment of unprotected receptive sex, compared with 47% of the men who did not report this risky behavior ($P < .0001$). Likewise, 77% of men reporting unprotected receptive anal sex with an HIV-positive partner also reported enjoyment of risk-related behavior, compared with 51% of those who did not report unprotected receptive anal sex with an HIV-positive partner ($P < .0001$).

Table 3 displays the 15 most prevalent distributions for combinations of factor scores and enjoyment scores and heavy alcohol use and noninjection drug use. The 2 largest subgroups (16% each) reported only noninjection drug use and only enjoyment of risk-related behavior. The third largest subgroup endorsed none of the factors. The majority of the study population (57%) exhibited combinations of factors, such as enjoyment of risk-related behavior, low communication skills, and use of noninjection drugs (7%). In all, 62 combinations of risk were observed out of a possible 64, indicating that in this cohort of MSM, there was considerable heterogeneity in terms of combinations of risk-related factors.

Logistic regression analyses of these data showed that different combinations of risk-related factors were associated with varying levels of self-reported sexual risk behaviors (Table 3). For example, those who exhibited the most prevalent pattern, involving only

TABLE 3—Combinations of Risk-Related Factors, Heavy Alcohol Use, and Noninjection Drug Use and Their Association With Risky Sexual Behaviors: EXPLORE, 1999–2001

Self-Efficacy[a]	Communication Skills[a]	Social Norms[a]	Enjoy URA[a]	Heavy Alcohol Use[a]	Noninjection Drug Use[a]	No. (%)	Estimated Odds Ratio for Risky Sex (95% Confidence Interval)
No	No	No	No	No	Yes	604 (16.1)	1.7 (1.5, 2.0)
No	No	No	Yes	No	Yes	599 (15.9)	2.0 (1.6, 2.4)
No	No	No	No	No	No	413 (11.0)	Reference
No	No	No	Yes	No	No	290 (7.7)	1.1 (1.0, 1.3)
No	Yes	No	Yes	No	Yes	256 (6.8)	4.2 (3.3, 5.3)
No	Yes	No	No	No	Yes	156 (4.2)	3.7 (3.0, 4.5)
Yes	Yes	No	Yes	No	Yes	108 (2.9)	10.2 (7.6, 13.7)
No	Yes	No	Yes	No	No	105 (2.8)	2.4 (2.0, 2.9)
No	Yes	No	No	No	No	89 (2.4)	2.1 (1.8, 2.4)
No	No	Yes	Yes	No	Yes	80 (2.1)	3.1 (2.3, 4.0)
No	No	No	No	Yes	Yes	76 (2.0)	1.9 (1.5, 2.5)
Yes	Yes	Yes	Yes	No	Yes	74 (2.0)	15.8 (11.5, 21.8)
No	No	Yes	No	No	Yes	62 (1.6)	2.7 (2.1, 3.4)
No	Yes	Yes	Yes	No	Yes	57 (1.5)	6.5 (4.8, 8.7)
No	No	No	Yes	Yes	Yes	51 (1.4)	2.2 (1.6, 2.9)
All other combinations[b]						739 (19.7)	

Note. Risky sex was defined as unprotected receptive or insertive anal sex with HIV-positive partners or partners of unknown status.
[a]Self-efficacy, communication skills, and social norms: yes = ≤ 50; no = > 50. Enjoy URA (unprotected receptive anal sex): yes = enjoy very much or enjoy; no = dislike or dislike very much. Heavy alcohol use: yes = ≥ 4 drinks per day or ≥ 6 drinks per occasion. Noninjection drug use: yes = any report of at least 1 type of noninjection drug.
[b]Of the total 62 combinations, 47 were classified as "other." All "other" combinations had frequencies less than 1.3%.

noninjection drug use, had an odds ratio (relative to those who reported none of the risk factors) of engaging in risky sex of 1.7 (95% confidence interval [CI]=1.5, 2.0). Conversely, the 12th most prevalent subgroup (2% of the cohort), whose members endorsed all of the factors examined, including enjoyment of unprotected receptive anal sex and noninjection drug use, had an odds ratio of 15.8 (95% CI=11.5, 21.8) for risky sex. The next most risky subgroup (3% of the cohort), with the same profile except for the social norm factor, had an odds ratio of 10.2 (95% CI=7.6, 13.7). The highest odds ratio observed was 17.3 (95% CI=12.0, 25.0), for the 28th most prevalent subgroup. Members of this subgroup endorsed all of the study factors associated with risk along with enjoyment of unprotected receptive anal sex, noninjection drug use, and heavy alcohol intake. The estimated odds ratios for all of the remaining 47 combinations of the risk factors (data not shown) were greater than the odds ratio for the reference group (i.e., 1.0).

DISCUSSION

EXPLORE baseline data reveal considerable heterogeneity in the study cohort of MSM in terms of the distribution of cognitive–behavioral factors that influence sexual risk taking and heavy alcohol use and noninjection drug use. The 2 most prevalent patterns accounted for only one third of the cohort. These factors also were significantly associated with self-reported risk behaviors among the cohort members. Our findings support an individualized approach to behavioral risk reduction counseling in which the specific targets are those most salient to an individual's unique profile.

One of the most common factors reported, by 75% of cohort members, was enjoyment of unprotected anal sex. This factor presents a potential barrier to behavior change motivation, which supports use of approaches such as motivational interviewing that are designed specifically for populations not strongly motivated to change.[16–19] In EXPLORE, motivational interviewing is used to identify ambivalence toward reducing risk behavior, with a counseling focus on enhancing intrinsic motivation for change by articulating reasons for and costs and benefits of change.

Weak communication skills were another prevalent factor, exhibited by 35% of the cohort and appearing in 7 of the top 15 most prevalent risk combinations. For some participants, communication difficulties appeared in combination with alcohol and drug use; for others, such difficulties appeared in combination with a low self-efficacy for adopting safer behaviors. To succeed in lowering risks among MSM presenting with these risk combinations, interventions need to incorporate strategies that provide information and behavioral skill building; an example of such a strategy is the information–motivation–behavior model[20–22] used in EXPLORE to teach specific skills in different contexts.

The third most prevalent factor combination comprised 11% of the cohort. Individuals exhibiting this combination, used as the refer-

ence group in the logistic regression analysis, endorsed none of the factors thought to be associated with risk behavior and reported neither heavy alcohol use nor noninjection drug use. All of the other combinations had odds ratios greater than 1, suggesting that participants in the reference group were less likely than the majority of the cohort to be engaging in high-risk behaviors at the time of enrollment.

Longitudinal studies[11,13] show, however, that risk behaviors among MSM can increase over time. Even among men showing low risk at baseline, it can be expected that some will increase their risk behavior over the duration of a trial. Individually tailored counseling approaches similar to that taken in EXPLORE allow counselors to reinforce current safer sex practices among these individuals while helping them anticipate changes in life circumstances and relationships that could be associated with increases in risk. For example, when a monogamous relationship is at risk of ending, counselors would rely on the information–motivation–behavior model[20–22] to provide training in communication skills regarding serostatus and on motivational interviewing[16–19] to address ambivalence about using alcohol or noninjection drugs, which might assist individuals in managing depressed mood but increase their likelihood of risky behaviors.

The EXPLORE baseline data support the relevance to at-risk MSM of the factors targeted by the study's counseling methods and the content of the behavioral intervention. In addition, the heterogeneity with which these factors were shown to be distributed among the cohort members reinforces the importance of a tailored approach in which structured modules are selected and implemented in a manner consistent with individuals' unique characteristics which predispose them to engage in risk behavior. ■

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Contributors

M.A. Chesney, B.A. Koblin, and T.J. Coates conceived the study and oversaw all aspects of its implementation. P.J. Barresi was a leader in the development of the EXPLORE intervention. M.J. Husnik and Y. Huang performed the data analyses. B.A. Koblin, C.L. Celum, G. Colfax, K. Mayer, D. McKirnan, and F.N. Judson supervised all aspects of study implementation at the individual research sites. All of the authors helped to conceptualize ideas, interpret findings, and review drafts of the article.

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Human Participant Protection

This study was approved by the institutional review boards of all institutions involved. Written informed consent was obtained from all participants.

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