

# Mediators of HIV Risk among African-American Men

**Robert M. Malow, Robert C. McMahon, Fred E.W. Peipman, Terri E. Jennings**

University of Miami

We evaluated the ability of key theoretical variables to prospectively predict level of HIV risk behavior at six months following the initial assessment among an understudied population of low-income, non-injection substance-abusing, heterosexual men (NI-SA-HM). We found that ethnicity, pretreatment condom use level and condom attitudes at intake predicted HIV risk at a 6-month follow-up. However, a number of variables (e.g.; perceived susceptibility to HIV infection, sexual response-efficacy, self-efficacy) that have emerged as significantly predictive of HIV risk in cross-sectional studies were not significant prospective predictors of HIV risk in the current study. The study emphasizes the value of examining longitudinal data in elucidating which factors may contribute to HIV risk reduction in designing interventions to produce risk reduction among NI-SA-HM.

This work was funded in part by Grant RO1 DA09520 from the National Institute on Drug Abuse and RO1 AA12115 from the National Institute on Alcohol Abuse and Alcoholism to Dr Malow.

## Introduction

HIV/AIDS seroprevalence is relatively high and rapidly increasing among non-injecting, substance abusing, heterosexual men (NI-SA-HM; Malow & Ireland, 1996). Prior studies have focused predominantly on men who share drug-injecting equipment or who engage in sex with other men because these behaviors confer a high level of HIV risk (Kalichman, 1998). Beyond the risk of these behaviors, the possibility of HIV transmission is significantly enhanced by various behaviors that have been associated with non-injection drug use such as unprotected sex with multiple partners, exchanging sex for drugs or alcohol, and substance use/abuse proximal to sex (Malow, Corrigan, Pena, & Calkings, 1993).

Cross sectional relationships between ARRM variables (e.g., self-efficacy, perceived susceptibility, HIV transmission knowledge, etc.) and HIV transmission risk behavior have been examined in diverse populations (gay and bisexual Men who have sex with Men, general population samples, minority women ( Rotheram-Borus, Rosario, Reid, et al., 1995; Catania, Coates,& Kegeles 1994; Gomez & Marin, 1993) including a few involving substance abusing populations. However, only a few studies have examined ARRM variables as prospective predictors of HIV risk behavior. In a recent review of published studies on psychosocial factors in HIV risk transmission, Flowers, Sheehan, Beail, and Smith, (1997) concluded that among ARRM variables, perceived risk and knowledge (both "labeling" stage variables) were minimally associated with HIV-TRBs. In contrast, ARRM variables from the commitment stage (better attitudes towards safer sex, social norms, and higher sexual self-efficacy) were much more strongly associated with frequent and consistent condom use (Flowers, et al., 1997).

Among cross sectional studies, Sands, Archer, and Puleo (1998) found that risk for AIDS was influenced by self-confidence, perceived barriers to HIV prevention, and sexual self-efficacy among 356 college students. In another study of HIV risk among college students, Hawa, Munro, and Doherty-Poirier (1998), showed that measures of HIV knowledge, motivation (including behavioral intentions, subjective norms, and attitudes), and three demographic variables (gender, age, and father's education) contributed significantly to predicting condom use and lifetime number of sexual partners. Catania, et al., (1994), examined ARRM variables in relation to current condom use in a study of unmarried heterosexual adults. For primary partners, high levels of condom use were related to high levels of health protective sexual communication, high condom enjoyment, and high commitment to condom use. For participants with secondary sexual partners, high levels of condom use were related to greater commitment to condom use, higher levels of norms supporting safer sexual behavior, greater sexual enjoyment, and high levels of health protective sexual communication (Catania, et al., 1994). Health protective sexual communication, commitment to use condoms and sexual enjoyment were significant predictors of condom use across primary and secondary partners (Catania, et al., 1994).

In a cross-sectional study examining psychosocial correlates of HIV risk in women attending drug treatment, Malow & Ireland (1996) used contextual and ARRM variables to predict HIV sexual risk behaviors. Drug use proximal to sex, more labeling of risky behaviors, and lower commitment to safer sex predicted higher levels of condom non-use, more high-risk partners, and higher overall HIV risk. The authors did not find that other ARRM mediating variables predicted greater condom use and attribute this to the role of important contextual variables such as financial dependence upon the male partner, couple dynamics, and the fact that the male is the one who must wear the condom during sexual intercourse (Malow & Ireland, 1996).

However, in an earlier study, Malow, et al., (1993) did find that ARRM variables including self-efficacy, sexual communication, and condom use skills were associated with higher levels of condom use among a sample of African-American drug users in treatment.

Among the few prospective studies, Morrill, Ickovics, Golumchikov, & Beren, (1996) found positive attitudes towards condoms and relationship involvement at the initial assessment predicted greater instances of initiating and/or maintaining safer sexual practices, such as condom use, at three month follow-up among heterosexual women. In a study of sexually active, drug abusers, Bowen and Trotter (1995) found higher condom assertiveness, self-reported intentions to start using condoms, and having multiple partners were associated with lower levels of unprotected sex at six month follow up (Bowen & Trotter, 1995).

This investigation evaluates the ability of key theoretical variables to prospectively predict HIV risk behavior among an understudied population of NI-SA-HM who abuse alcohol and/or other drugs (AODs). Guided by the AIDS Risk Reduction Model (ARRM; ARRM (Catania et al., 1990), we studied a set of variables that have been suggested as important. These variables include (a) commitment to safer sex practices; (b) knowledge regarding HIV transmission; (c) perceived susceptibility of acquiring HIV; (d) anxiety about contracting HIV; (e) condom attitudes; (f) response efficacy, belief that effective responses exist to prevent HIV transmission; and (e) sexual self-efficacy, belief that one can adopt and maintain preventive behaviors. Demographic variables were also measured and included age, ethnicity, mean monthly income, and level of education. Further, because associations between our psychosocial predictors and follow-up HIV risk outcomes may be attributable to predictor linkages with initial AOD abuse levels and/or with AOD abuse outcomes, the contribution of initial and follow-up AOD levels was controlled when examining our model.

We should clarify that although our selection of variables was based on constructs emphasized in ARRM and other prominent behavior change theories, this study is not intended to comprehensively incorporate the constructs of the ARRM or any given theory nor to be a test of this or any other single theory. This is consistent with recent reviews suggesting that behavior change intervention models may be more effective if they draw upon several well-established theories and intervention modalities rather than emphasizing a “pure test” of single theories (Goldfried & Wolfe, 1998; NIH AIDS Research Program Evaluation Task Force, 1997). We should also clarify that because of sample size limitations and to avoid Type 1 errors, the variables included in our model do not include many factors (e.g., partner norms, social support) that may mediate outcome. The primary purpose of this research was to provide a preliminary evaluation of the ability of key theoretical variables to prospectively predict HIV risk behavior in an understudied group, NI-SA-HM. Because most prior HIV prevention studies involved gay and bisexual men or injection drug using opioid addicts (Malow, West, Corrigan, Pena, & Cunningham, 1994; Longshore, Anglin, and Hsieh, 1997), it is crucial to study NI-SA-HM to test theoretical models regarding putative psychosocial factors associated with HIV sexual risk behaviors that may direct HIV prevention intervention efforts. Our use of longitudinal methodology provides valuable information about the usefulness of such variables in predicting HIV risk behaviors across time.

## **Method**

Participants were selected from 312 male veterans who met DSM-III-R criteria for drug dependence as determined by the Structured Clinical Interview for DSM Disorders (SCID; Spitzer, Williams, Gibbon, & First, 1989) and who participated in a 6-week VA inpatient drug dependence treatment program. One hundred and forty-six of the original 312 assessed at intake received follow-up assessments 6 months after completion of treatment. The mean age for this group ( $n = 146$ ) was 41.03 years ( $SD = 7.04$ ), the average level of educational attainment was 12.78 years ( $SD = 1.80$ ), and the mean level of income per month was \$703.73 ( $SD = \$1001.65$ ). Participants were 61.6% African American, 31.1% Non-Hispanic White, and 7.3% Hispanic.

### **Assessment Procedures**

Participants were evaluated after intake into treatment, and at six months following discharge from treatment. Assessments were administered by trained master's level clinicians in a one-on-one interview format to enhance rapport and facilitate task completion. All participants signed informed consent forms. The confidential nature of the study was emphasized. Intake assessments were generally administered 1 week after admission but not before treatment staff judged that detoxification was adequately completed.

### **Measures**

The Addiction Severity Index (ASI), a structured clinical research interview, was used to gather socio-demographic data from each subject (McLellan, Luborsky, Cacciola, Griffith, et al., 1985). The ASI is well validated for use in clinical and research settings (McLellan et al., 1985; Zanis, McLellan, Canaan, & Randall, 1994). Sociodemographic data used in this study included age, level of education, level of income and ethnicity.

The Risk Behavior Assessment (RBA) was used to measure sexual risk behaviors (National Institute on Drug Abuse, 1991). It was administered to assess percent occurrences of protected sex across all sexual acts (vaginal, oral and anal) during the 30 days prior to admission to treatment and during the 30 days prior to follow-up assessment at 6 months after treatment completion. Those who reported no sexual activity were recorded as having 0% occurrences of unprotected sex. The RBA has shown adequate test-retest reliability for sexual risk behaviors (Needle, Coyle, Genser, & Trotter, 1995).

The AIDS Risk Measurement Questionnaire (ARMS-Q; Gibson, Lovelle-Drache, Young, & Chesney, 1992) was developed to reliably and validly measure HIV-specific constructs hypothesized to be influential in predicting HIV risk behaviors, according to the ARRM model. These include: (a) commitment to safer sex; (b) factual knowledge regarding HIV transmission; (c) perceived susceptibility to acquiring HIV; (d) anxiety about becoming infected with HIV; (e) condom attitudes; (f) sexual response efficacy; and (g) sexual self-efficacy.

**Commitment to Safe Sex.** Subjects' commitment to reduce sexually risky behavior was assessed with 6-items, (measured on a five point Likert scale) with responses ranging from "very unlikely" to "very likely" (Cronbach's alpha = .58). Illustrative items: "I will have only safer sex." "I will have sex with just one person."

**Factual Knowledge.** Knowledge regarding HIV transmission was assessed using 8-items (four point Likert scale) with responses ranging from "strongly disagree" to "strongly agree". Illustrative items: "Vaginal intercourse is just as risky as anal intercourse for passing the HIV virus." "The majority of people with AIDS die within two years of being told they have it."

**Perceived Susceptibility Scale.** Perceived risk for contracting HIV was assessed using 4-items (four-point Likert scale) with response options ranging from "strongly disagree" to "strongly agree" (Cronbach's alpha = .65). Items: "It would be easy for me to get the HIV virus or AIDS." "Sooner or later I expect to catch the HIV virus or AIDS."

**Anxiety Scale.** Anxiety about becoming infected with HIV was assessed using 2-items (four point Likert scale) with responses ranging from "strongly disagree" to "strongly agree" (Cronbach's alpha = .76). Items: "I worry about getting the HIV virus or AIDS." "I worry about getting sick with the HIV virus or AIDS."

**Subjects' Condom Attitudes.** Subjects' attitudes towards using condoms was assessed using 5-items (four point Likert scale) with responses ranging from "strongly disagree" to "strongly agree" (Cronbach's alpha = .87).

Illustrative items: "There are ways to make condoms sexually exciting."

"Sex is just as enjoyable with condoms as without."

**Sexual Response Efficacy.** Subjects' beliefs about the efficacy of enacting safer sex behaviors to prevent the acquisition of HIV was measured using 4-items (four point Likert scale) with responses ranging from "strongly disagree" to "strongly agree" (Cronbach's alpha = .67). Sample items: "You won't give the HIV virus to your sex partner if you use condoms." "You can keep from getting the HIV virus by always having safer sex."

**Sexual Self-Efficacy.** Subjects' confidence to adopt and maintain HIV preventive behavior was assessed using 7 items (four point Likert scale) with response options ranging from "strongly disagree" to "strongly agree" (Cronbach's alpha = .77). Illustrative items: "Safer sex isn't that difficult." "Using condoms doesn't take a lot of effort."

Attrition analyses established that those who were available for follow-up at 6 months ( $N = 146$ ) post-treatment did not differ significantly from those who were lost to follow-up ( $N = 166$ ) regarding background factors including ethnicity, monthly income, number of times treated for alcohol or drug abuse, percent condom use, and ARRM-Q variables including susceptibility, anxiety, commitment to safe sex, condom attitudes, knowledge, sexual response efficacy, and sexual self-efficacy (all  $p$ 's.  $> .05$ ). However, those who were lost to follow-up were significantly younger on average ( $F(2,309) = 3.23$   $p = .04$ ).

### **HIV/AIDS Risk Reduction Attitudes and Beliefs (ARRM Scales)**

Means and standard deviations for intake ARRM variables and values reflecting percent condom use at six month follow-up, as well as bivariate correlations among these variables are presented in Table 1. On average, based upon data collected at the treatment intake assessment, this sample of veterans revealed a high level of commitment to practicing safer sex, inadequate knowledge regarding HIV transmission, and moderate levels of anxiety about becoming infected with HIV. On average, they reported moderately favorable condom use attitudes and moderate agreement with statements reflecting the efficacy of enacting safer sex behaviors to prevent transmission of HIV. They expressed little agreement with statements reflecting a belief in their susceptibility to contracting HIV. Subjects expressed moderate agreement with statements reflecting confidence in their ability to adopt and maintain HIV preventive behaviors (see Table 1). In bivariate analyses, moderate associations were found between: (a) sexual self-efficacy and both condom attitudes and commitment to safer sex practices, (b) perceived susceptibility to HIV infection and anxiety about becoming infected, (c) percent condom use at intake and at six months, (d) drug abuse severity at intake at six months. In addition to intake condom use, percent condom use at 6 months was significantly associated with education level, income, and condom attitudes (see Table 1).

Hierarchical regression was employed to determine if ARRM variables (commitment to safer sex, knowledge, susceptibility, anxiety, condom attitudes, sexual response efficacy, and sexual self-efficacy) improved prediction of condom use at six months after controlling for age, education level, monthly income, ethnicity, and intake percentage of protected sex acts. Predictors were entered in two blocks. Covariates were entered in the first block. ARRM variables were entered in the second.

Table 2 displays the unstandardized regression coefficients ( $B$ ) and the intercept, the standardized regression coefficients ( $b$ ), the semi-partial correlations ( $sri^2$ ), and  $R$ ,  $R^2$ , and adjusted  $R^2$  after entry of both blocks of predictors.  $R$  was significantly different from zero at the end of both steps in the sequential regression analysis. After the second step, with all predictor variables in the equation,  $R^2 = .28$ ,  $F(15, 130) = 3.34$ ,  $p < .001$ .

The variables entered in the first block (i.e., covariates) contributed significantly to the prediction of outcome percent occurrences of protected sex,  $R^2 = .22$ ,  $F(8, 137) = 4.95$ ,  $p < .001$ , with percent condom use at intake contributing the most ( $b = .29$ ,  $T = -3.66$ ,  $p < .001$ .) With the addition of the ARRM variables in block 2,  $R^2 = .28$ ,  $F(15, 130) = 3.34$ ,  $p < .001$ . Examination of the standardized regression coefficients reveals percent condom use at intake contributed most among variables in the equation ( $b = .30$ ,  $T = 3.64$ ,  $p < .001$ .) Percent condom use at intake and condom attitudes ( $b = .24$ ,  $T = 2.66$ ,  $p < .01$ ) contributed most among variables in the final model. Sexual self-efficacy contributed to prediction solely by virtue of its correlation with other predictor variables (see discussion of suppressor variables, Tabachnick and Fidel, 1996). Its bivariate association with 6-month % unprotected sex was not significant (See Table 1).

### **Discussion**

Results of this investigation provide preliminary support for the value of pretreatment condom use levels and pretreatment condom attitudes in longitudinally predicting HIV sexual risk behaviors among non-injection substance-abusing, heterosexual men (NI-SA-HM), while suggesting that sociodemographic variables (income, education, ethnicity) also contribute to our understanding of HIV risk. Greater condom use and more positive condom use attitudes at intake predicted having engaged in a greater proportion of protective sexual episodes at a 6-month follow-up.



In contrast with prior research involving cocaine-abusing men (Malow et al., 1993; Malow et al., 1994), greater self-efficacy (i.e., belief that one can adopt and maintain HIV preventive behaviors) at intake did not prospectively predict condom use at follow-up in this sample of NI-SA-HM. The value of sexual self-efficacy as a predictor of HIV risk behavior has repeatedly emerged in previous cross-sectional studies of HIV risk behaviors among college students (Freimuth, Hammond, Edgar, McDonald, & Fink, 1992), adolescents (Steers, Elliot, Nemiro, Ditman, & Oskamp 1996), gay men (Aspinwall, Kemeny, Taylor, & Schneider 1992), and among both male and female substance abusers (Malow and Ireland, 1996; Longshore, Anglin, & Hsieh, 1997; Malow, West, Pena, Corrigan, & Cunningham, 1994). However, none of these studies established sexual self-efficacy as an important prospective predictor of condom use. It may be that engaging in safer sexual practices leads to a sense of efficacy for the time such behaviors are practiced. In this investigation, sexual self-efficacy did not operate as a stable attitude that influenced risk behavior over time. Other factors may determine condom use patterns over the longer term. Despite our findings, sexual self-efficacy warrants further investigation as a mediator of risk behavior among substance abusers.

Results of the current study indicate that positive attitudes toward condom use may also be an important predictor of condom use, a logical assumption that may prove important in designing HIV prevention efforts. Jemmott & Jemmott (1991) found that subjects who displayed more favorable attitudes towards condoms also reported firmer intentions to use condoms during subsequent sexual encounters. A number of researchers have found that favorable attitudes towards condom use are positively correlated with actual condom use. Catania, et al., (1994) examined correlates of condom use in a longitudinal study of heterosexuals considered at risk for HIV infection. They found that among other variables (i.e., commitment to use condoms, labeling one's behavior as risky for HIV infection), high levels of positive condom attitudes were associated with higher levels of condom use (Catania, et al., 1994). In a cross-sectional study of behavioral, psychological, and gender issues in relation to HIV prevention among high-risk African American women, Hetherington, Harris, Barker, Kavanagh, & Scott, (1996) found that negative attitudes about condoms were significantly associated with nonuse of condoms among the identified sample. Ingram-Wigfall (1996) also documented a relationship between negative condom attitudes and higher levels of HIV risk behaviors among a sample of predominantly minority participants recruited from a recreational facility. The current study serves to expand upon previous studies examining condom attitudes in relation to HIV risk behaviors by providing evidence for prospective prediction. Results of this study suggest that emphasis on improving condom attitudes may prove important in HIV prevention efforts among male AOD abusers receiving HIV-TRR intervention.

A number of ARRM variables including commitment to safe sex, perceived susceptibility to HIV infection, anxiety about contracting HIV, and sexual response efficacy have emerged as significantly predictive of HIV-TRBs in cross-sectional studies (Aspinwall, et al., 1992; Steers et al., 1996). However, none of these emerged as significant prospective predictors of percent condom use in the current study. Current findings suggest caution in assuming that these variables are important mediators of HIV risk over the longer term at least among AOD abusing men in treatment. Other factors may account for patterns of stability and change in HIV-TRBs over time. For example, differences in gender role orientation, or degree of adherence to traditionally masculine roles in relationships, has previously been found to result in corresponding differences in health seeking behaviors (Campbell, 1995). Such roles may influence the degree to which individuals change or maintain their previous levels of condom use behavior. Participants in this study were all males, whereas many of the previous studies involved men and women (Freimuth, et al., 1992; Malow & Ireland, 1996, Catania, et al., 1994b). It is possible that the ARRM-related attitudes, beliefs, and behaviors in different ways for men than for women. Further study of gender differences in the mediators and moderators of HIV transmission risk behavior seem warranted.

### **Limitations**

Caution must be used in generalizing the results of this study to other populations for several reasons. The sample used included men in a VA inpatient unit. Therefore, it is likely that HIV-related knowledge, attitudes, and sexual risk behaviors are different in other drug abusing subgroups. It is also possible that other unidentified factors contributed much more heavily to risk behavior than those examined in this study. Sexual risk behavior occurs in an interpersonal context where both sexual partners, in varying degrees, contribute to the likelihood of safe versus risky practices. It is important that future studies of HIV risk behavior draw upon models that extend beyond the intrapersonal cognitive-behavioral factors (i.e. ARRM variables) and incorporate interpersonal/systemic contextual mechanisms influencing risk and risk reduction (Malow, Cassagnol, McMahan, Jennings and Roatta, in press).

Questions have been raised regarding the validity of self-reports of drug users (Malow, Gustman, Ziskind, McMahan & St. Lawrence, 1998). A limitation of this study is that the primary outcome was measured with participants' self-reports, which might have been unintentionally or intentionally inaccurate (Malow, Gustman, Ziskind, McMahan & St. Lawrence, 1998).

Although we cannot definitely rule out this possibility, several aspects of our methods and findings make inaccurate self-reports a less likely explanation for our results. We used several strategies, such as anchoring significant events on a time line, using calendars, and ensuring and emphasizing confidentiality, to increase participants' ability to recall and to motivate them to respond honestly. (Malow, Gustman, Ziskind, McMahan & St. Lawrence, 1998).

Despite the limitations of this study, the findings have important implications for future research and program development in the area of HIV prevention. Our findings call into question the importance of sexual self-efficacy as a prospective predictor of condom use among substance abusers after completion of AOD treatment. However, the emergence of positive condom attitudes as a predictor of percent condom use is an important finding and suggests the importance of engendering positive condom attitudes in HIV risk reduction and prevention programs.

**Table 1**  
Intercorrelations Among Variables Included in the Regression Analysis

Variable In Equation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Mean	S.D.
1. Percent Condom Use at 6 Months	-	.04	.16*	-.14*	.35***	-.12	.04	.05	.06	-.07	-.07	.22**	.03	.05	56.37	45.59
2. Age	-	---	-.04	-.02	.02	-.24**	-.16*	-.07	-.03	-.14*	-.11	-.08	-.00	-.17*	41.03	7.04
3. Education	-	---	---	.10	.07	-.03	.02	.11	.05	-.05	-.01	.01	.00	.04	12.78	1.80
4. Monthly Income	-	---	---	---	-.12	.11	.04	.01	.01	.08	.11	-.05	.05	-.17*	703.73	1001.65
5. Percent Condom Use at Intake	-	---	---	---	---	-.06	.04	.06	.22**	-.18*	-.12	.20**	-.03	.24**	63.69	44.99
6. Intake Drug Composite	-	---	---	---	---	---	.36***	.02	.01	.18*	.10	-.05	-.14*	-.01	.20	.13
7. Six Month Drug Composite	-	---	---	---	---	---	---	-.14*	.12	.18*	.11	-.14*	-.02	-.15*	.12	.11
8. Commitment to Safe Sex	-	---	---	---	---	---	---	---	.08	-.20**	.11	.17*	.24**	.38***	4.56	.59
9. Knowledge about HIV Transmission	-	---	---	---	---	---	---	---	---	-.11	-.07	.10	-.00	.12	22.95	2.82
10. Perceived Susceptibility	-	---	---	---	---	---	---	---	---	---	.34***	-.14*	-.05	-.15*	.25	.16
11. Anxiety about getting HIV	-	---	---	---	---	---	---	---	---	---	---	.00	.05	-.05	2.49	1.04
12. Condom Attitudes	-	---	---	---	---	---	---	---	---	---	---	---	.07	.53***	2.51	.81
13. Sexual Response Efficacy	-	---	---	---	---	---	---	---	---	---	---	---	---	.15*	3.13	.64
14. Sexual Self-Efficacy	-	---	---	---	---	---	---	---	---	---	---	---	---	---	2.97	.60

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

**Table 2**  
Sequential Regression of ARRM Variables on Percent Condom Use at Six-Month Follow-Up

Variables	B	b	Sr <sup>2</sup>
Age	.25	.04	
Education	3.79	.15	
Monthly Income	-.01	-.17	
Non-Hispanic White	-10.51	-.11	
African American	-46.01	-.27	
Percent Condom Use at Intake	.30	.30	.22***
Intake Drug Abuse Composite Score	-18.72	-.06	
Six Month Drug Abuse Composite Score	52.33	.12	
Commitment to Safe Sex	5.38	.07	
Knowledge about HIV Transmission	-1.14	-.07	
Perceived Susceptibility to HIV	7.08	.03	
Anxiety about getting HIV	-.75	-.02	
Condom Attitudes	13.60	.24	
Sexual Response Efficacy	5.18	.07	
Sexual Self-Efficacy	-15.63	-.21	
Constant	-10.46		.06***
		Adjusted	R <sup>2</sup> =.28 R <sup>2</sup> =.20 R=.53

\*\*\*  $p < .00$



## References

- Aspinwall, L.G., Kemeny, M.E., Taylor, S.E., & Schneider, S.G. (1992). Psychosocial predictors of gay men's AIDS risk-reduction behavior. *Health Psychology, 10*(6), 432-444.
- Bowen, A.B., & Trotter, R. (1995). HIV risk in intravenous drug users and crack cocaine smokers: Predicting stage of change for condom use. *Journal of Consulting and Clinical Psychology, 63*(2), 238-248.
- Catania, J., Kegeles, S., & Coates, T. (1990). Toward an understanding of risk behavior: An AIDS risk reduction model (ARRM). *Health Education Quarterly, 17*, 53-72.
- Catania, J.A., Coates, T.J., & Dolcini, M.M. (1994). Correlates of condom use among Black, Hispanic, and White heterosexuals in San Francisco: The AMEN longitudinal study. *AIDS Education and Prevention, 6*(1), 12-26.
- Catania, J.A., Coates, T.J., & Kegeles, S. (1994). A test of the aids risk reduction model: Psychosocial correlates of condom use in the AMEN cohort study. *Health Psychology, 13*(6), 548-555.
- Flowers, P., Sheeran, P., Beail, N., & Smith, J.A. (1997). The role of psychosocial factors in HIV risk-reduction among gay and bisexual men: A quantitative review. *Psychology and Health, 12*(2), 197-230.
- Freimuth, V.S., Hammond, S.L., Edgar, T., McDonald, D.A., & Fink, (1992). Factors explaining intent, discussion and use of condoms in first-time sexual encounters. *Health Education Research, 7*(2), 203-215.
- Gibson, D.R., Lovelle-Drache, J., Young, M.T., & Chesney, M. (1992). HIV risk linked to psychopathology in IV drug users. *International Conference on AIDS. Abstract POC 4691*.
- Goldfried, M., & Wolfe, B. (1998). Toward a more clinically valid approach to therapy research. *Journal of Consulting and Clinical Psychology, 66*, 143-150.
- Gomez, C.A., & Marin, B. (1993). *Gender, ethnicity, and HIV prevention: Will women demand condom use?* Presentation at Annual Meeting of the American Psychological Association, Toronto, Canada.
- Hawa, R., Munro, B.E., & Doherty-Poirier, M. (1998). Information, motivation, and behaviour as predictors of AIDS risk reduction among Canadian first year university students. *Canadian Journal of Human Sexuality, 7*, (1), 9-18.
- Hetherington, S.E., Harris, R.M., Barker, R.B., Kavanagh, K.H., & Scott, D.E. (1996). AIDS prevention in high-risk African American women: Behavioral, psychological, and gender issues. *Journal of Sex and Marital Therapy, 22*(1), 9-23.
- Ingram-Wigfall, N.M., (1996). *Variables related to AIDS high risk behaviors among minority group members*. Dissertation Abstracts International: Section B: The Sciences and Engineering.
- Jemmott, L.S., & Jemmott, J.B. (1991). Applying the theory of reasoned action to AIDS risk behavior: Condom use among Black women. *Nursing Research, 40*(4), 228-234.
- Kalichman, S. C. (1998). *Preventing AIDS: A Sourcebook For Behavioral Interventions*. Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.
- Longshore, D., Anglin, M.D., & Hsieh, S.C. (1997). Intended sex with fewer partners: An empirical test of the AIDS risk reduction model among injection drug users. *Journal of Applied Social Psychology, 27*(3), 187-208.
- Malow, R., Gustman, S., Ziskind, D., McMahon, R., & St. Lawrence, J. (1998). Evaluating HIV prevention interventions among drug abusers: Validity issues. *Journal of HIV/AIDS Prevention & Education for Adolescents and Children, 2*, 21-40.
- Malow, R., West, J., Corrigan, S., Pena, J.M., & Cunningham, S. (1994). *Outcome of a psychoeducation HIV prevention training AIDS Education and Prevention, 6*, 113-125.
- Malow, R.M., Corrigan, S.A., Pena, J.M., & Calkins, A.M. (1993). Mood and HIV risk among drug dependent veterans. *Psychology of Addictive Behaviors, 6*(2), 131-134.
- Malow, R.M., S.A., Ireland, S.J. (1996). HIV risks correlates among non-injection dependent men in treatment. *AIDS Education and Prevention, 8*, 226-235.
- Malow, R.M., Cassagnol, T, McMahon, R., Jennings, T.E. & Roatta, V.G. (in press). Relationship of psychosocial factors to HIV risk among hatian women. *AIDS Education and Prevention*.
- McLellan, A.T., Luborsky, L., Cacciola, J., Griffith, J., McGahan, P., & O'Brien, C.P. (1985). *Guide to the Addiction Severity Index: Background, administration, and field testing results. (DHHS Publication No. ADM 85-1419)*. Washington, DC: US Department of Health and Human Services.
- Montgomery, S. B., Joseph, J.G., Becker, M.H., & Ostrow, D.G. (1991). The Health Belief Model in understanding compliance with preventive recommendations for AIDS: How useful? *AIDS Education and Prevention, 1*(4), 303-323.
- Morrill, A.C., Ickovics, J.R., Golumchikov, V.V., & Beren, S.E. (1996). Safer sex: Social and psychological predictors of behavioral maintenance and change among heterosexual women. *Journal of Consulting and Clinical Psychology, 64*, (4), 819-828.
- National Institute on Drug Abuse. (1991). Risk behavior assessment. Rockville, MD: Author. Needle, R.H., Coyle, S.L., Genser, S.G., & Trotter, R.T. (1995). *Introduction: The social network research paradigm. NIDA Research Monograph, 151*, 1-2.
- NIH AIDS Research Program Evaluation Task Force (1997). Author. Rotheram-Borus, M.J., Rosario, M., Reid, et al. (1995). Predicting patterns of sexual acts among homosexual and bisexual youths. *American Journal of Psychiatry, 152*, 588-595.
- Sands, T., Archer J., & Puleo, S. (1998). Prevention of health-risk behaviors in college students: Evaluating seven variables. *Journal of College Student Development, 39*(4), 331-342.
- Spitzer, R.L., Williams, J.B.W., & Gibbon, M., & First, (1989). *Structured Clinical Interview for the DSM-III-R (SCID-II)*. New York: New York State Psychiatric Institute, Biometrics Research.
- Steers, W.N., Elliot, E., Nemiro, J., Ditman, D., & Oskamp, S. (1996). Health beliefs as predictors of HIV-preventive behavior and ethnic differences in prediction. *Journal of Social Psychology, 136*(1), 99-110.
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using Multivariate Statistics (3rd edition)*. Harper Collins: New York.
- Zanis, D.A., McLellan, A.T., Canaan, R.A., & Randall, M. (1994). Reliability and validity of the ASI with a homeless sample. *Journal of Substance Abuse Treatment, 11*, 541-548.

**Send Manuscript Correspondence to**

Dr. Robert Malow

University of Miami, School of Medicine/ JMH  
 Mental Health/Hospital Centers  
 Department of Psychiatry and Behavioral Sciences  
 1695 N.W. 9 Ave. Suite

Received: April 4, 2002

Accepted: May 7, 2002

Revised: May 6, 2002