

PREVENTING HIV SECONDARY TRANSMISSION:  
AN INTEGRATIVE REVIEW

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## ABSTRACT

Armed with effective interventions, nurse practitioners, nurses, and others who provide care to persons with HIV can reduce the rate of secondary transmission of this deadly virus among their patients. Therefore, the purpose of this integrative review was to examine the current research literature to determine the level of effectiveness of interventions aimed at reducing such secondary transmission. The effective interventions reviewed consisted primarily of a combination of strategies that included education, counseling, and skills training. These strategies most often were supported by Social Cognitive Theory or a combination of behavior-based theories. Interventions effectively increased condom use, partner notification, and other safe sex practices. Because the interventions were effective whether brief or two hours in duration, many of them are appropriately and easily implemented by healthcare providers in a private practice or clinic setting.

Almost 16,000 people worldwide become infected with Human Immunodeficiency Virus (HIV) everyday (Marieb, 2001). The current prevalence of this disease in the United States is estimated at between 800,00 and 900,000 (CDC, 2003). The number of people living with AIDS in the year 2000 was 322,865, which is an increase from the 274,624 people living with AIDS in 1998 (CDC, 2003). All HIV positive people need to be educated on effective methods of preventing secondary transmission in order to decrease the spread of the HIV infection and AIDS. However, the research literature is unclear regarding the content and methods of interventions to reduce the secondary transmission in primary care settings (Marks, et al., 2002).

In 1997, HIV/AIDS was the leading cause of death in young adults; but by 2000, it was not even in the top ten (Wilson & Sande, 2001). With improved medical management and prophylactic treatments, patients are living longer with this disease; however, transmission rates still continue to climb despite prevention efforts (Mitchell & Linsk, 2001). Some researchers attribute these rising rates to a false sense of well-being associated with improved HIV management and a resultant increase in unprotected sexual acts and HIV transmission (DiClemente, Wingood, DelRio, & Crosby, 2002). For this reason, it is vitally important to focus on preventing secondary HIV transmission.

With their strong emphasis on prevention and education, Advanced Practice Nurses are in a prime position to teach secondary transmission prevention. However, without state of the art knowledge on specific evidenced-based secondary prevention interventions, the teaching may lack critical elements. Therefore, the purpose of this study is to examine current theory-based behavioral interventions aimed at preventing HIV secondary transmission and to determine their level of effectiveness. In the past five

to seven years, researchers have begun testing interventions for use by healthcare providers in primary care settings. However, there has been no definitive published compilation of the evidence on the effectiveness of these interventions.

## Review of Literature

### *HIV Transmission and Management*

Every new infection begins with an infected person. One in three HIV positive persons still practice some sort of risky sexual behaviors (Kalichman et al., 2001). Many new HIV cases are transmitted from people who are well aware of their serostatus (Marks, Burns, & Peterman, 1999). The CDC (2003) defines HIV related risky behavior as any person using IV drugs and/ or any person who has unprotected sex with a person who is at risk for HIV. Methods of preventing secondary transmission are usually aimed at decreasing risky behaviors by increasing one's knowledge of these behaviors, improving behavioral skills, cognitive-behavioral self-management, enhancing social support systems, and negotiating assertive training (Kelly & Kalichman, 2002; Shumaker et al., 1998).

### *Theory Based Interventions*

One way to construct a behavioral intervention is through a research-based theory. An outline, implementation, and evaluation of the behavioral intervention can be based on that chosen theory (Ervin, 2002). With the absence of a theoretical framework, intervention aims are weakened and often ineffective (Mantell, DiVittis, & Auerbach, 1997). It is important to structure HIV secondary prevention interventions around an individual's specific needs, taking into consideration their risks, ethnicity, culture, and social environment (DiClemente, et al., 1998). Interventions must also take into

consideration social attitudes, norms, and differences (Marks, Burris, & Peterman, 1999). Risk reduction interventions will be more successful if they are focused around cultural sensitivity (Mantell et al., 1997).

Many contributions to alleviate high-risk behaviors are psychologically based; therefore, interventions in the research literature have been based on the Social Cognitive Theory (SCT), the Health Belief Model (HBM), Prochaska's Stages of Change Model, the Theory of Reasoned Action, and the AIDS Risk Reduction or Information Motivation Belief (IMB) Skills Model (Kelly & Kalichman, 2002; Mantell et al., 1998; Marks et al., 1999). These theories often frame interventions aimed at personality, development, behavior pathology, and health promotion and allow the researcher to identify behaviors and base interventions accordingly. Behavioral interventions contribute to the prevention of secondary transmission and arm the HIV positive person with a sense of personal responsibility.

A meta-analysis by Kim et al. (1997) began to analyze the idea of theory-based interventions; however, the inclusion criteria included more than this type of intervention. This study also looked at interventions based on community and cultural issues as well as developmental issues. This meta-analysis also did not exclude HIV negative individuals, which is of interest to the authors of this integrative review.

### *Behavioral Counseling*

HIV counseling is one of the primary ways of delivering any behavioral intervention in a primary care setting (Mark et al., 1999). Shumaker et al. (1998) approached behavioral counseling on the following five levels: (a) cognitive level dealing with the client's knowledge of information; (b) attitudinal level dealing with the

client's beliefs, intentions, and stage or readiness to change; (c) instrumental level dealing with the client's skills necessary to make a change; (d) behavioral level dealing with the client's behavior and skills; and (e) social support level dealing with the client's support system and resources.

Shumaker et al. (1998) also addressed behavioral counseling with the following "Five A's": (a) address the agenda or the particular risky behavior; (b) assess the client's knowledge, beliefs, concerns, readiness to change, and past experiences with change; (c) advise the client with educational materials and advice; (d) assist the client with the behavioral change by providing support, initiating a plan with set goals, and identifying barriers and resources; and (e) arrange for follow up to assess the risky behavior.

Shumaker's five levels and five "A's" of behavioral counseling are congruent with the theories previously discussed.

HIV is a life threatening disease for which there is no cure. It is essential to tie together the past and current research to determine the specific elements of effective secondary transmission prevention strategies. Theory driven research provides a framework for changing behavior that is necessary in the HIV positive community. This integrative review of the research literature will answer the following questions:

- (1) What HIV secondary transmission prevention strategies are currently used?
- (2) Which of the above strategies are effective in preventing secondary HIV transmission, and what is the evidence of their effectiveness?
- (3) On which behavior-based theories are the effective interventions based?

## Method

### *Research Design*

The design chosen for this research was an integrative review. Integrative reviews summarize and synthesize information from different sources, highlighting the most relevant issues (Cooper, 1982) and can provide valuable current evidence-based clinical information to practitioners.

### *Study Sample*

The primary method of data collection was accomplished through on-line computer searches of the following databases: CINAHL (Cumulative Index to Nursing and Allied Health Literature), MEDLINE, and PsychINFO. Keywords used were HIV, secondary transmission, behavior transmission, and research. The search included the ten year period, 1993 to 2003. The inclusion criteria included English language, research literature only, sample of human subjects, sample of HIV positive persons, the implementation of a behavioral intervention, and the use of an intervention aimed at preventing secondary transmission. Because the most accurate study includes every relevant article published (Jackson, 1980), this integrative review included all ten articles that met the inclusion criteria.

### *Analysis Plan*

A critical step in an integrative review is the analysis of the collected data to determine its relevancy (Cooper, 1982). To aid with summary and categorization of the data by common characteristics, the authors summarized the ten articles in table format using the following headings: (1) source (author and year); (2) study location; (3) independent variable/ intervention; (4) theory/ concept; (5) sample size and

characteristics; (6) research design; (7) dependent variable/ outcome; and (8) threats to internal and external validity. The collected data is formatted in Tables 1 and 2. The use of the table also allowed the reviewers to easily identify common methodological flaws in the studies. The authors designed a standardized data collection tool (see Appendix) in an effort to reduce subjectivity and followed the five stages of integrative literature review by Cooper (1982). These five steps include the formulation of a problem, collection of the data, evaluation of the data, analysis/ interpretation of the data, and documentation of the results.

## Results

### *Setting*

All ten research studies reviewed were conducted in the United States (Belcher et al., 1998; Cleary et al., 1995; DeRosa & Marks, 1998; Fogarty et al., 2001; Greenberg & Johnson, 1996; Kalichman et al., 2001; Kelly et al., 1993; Kilmarx, Hamers, & Peterman, 1998; Otten et al., 1993, & Rotherman- Borus et al., 2001). Three of these were conducted in more than one setting. All were in large metropolitan areas either on the east or west coast.

### *Research Design*

The majority (64%) of the research studies were experimental in design, the preferred method of understanding the relationship between independent and dependent variables (Burns & Grove, 2001). Other research designs used in the studies included (a) historical cohort and (b) descriptive cross sectional. Table 1 provides design description.

### *Sample*

Sample sizes ranged from 68 (Kelly et al., 1993) to 1, 611 (Fogarty et al., 2001). Males predominated as subjects in these studies: four studies sampled only males; four studies sampled both males and females; but only two studies sampled only females.

Ethnicity of subjects included white, African American, Latino, and "other" and subject's ages ranged from 13 to 51 years. Table 1 provides a more detailed list of subject characteristics.

#### *Strategies for Prevention of Secondary HIV Transmission*

The secondary transmission prevention strategies were categorized as education (N=9), counseling (N=10), and skills training (N=5). Interventions including education covered such topics as basic AIDS knowledge, medical management, STD screening and treatment, and acute AIDS related problems. Interventions including counseling covered such topics as decreasing risk behaviors in general, partner notification, decreasing substance abuse, promoting self-efficacy, emotional distress, and formulating support groups. Interventions including skills training promoted proper condom and contraceptive use. The intervention frequency ranged from one session to 52 sessions. The intervention duration ranged from five minutes to two hours. Ninety percent of the studies used more than one intervention strategy. Table 2 provides a more detailed list of study characteristics.

#### *Evidence of Effective Interventions*

Each of the ten studies focused on preventing the spread of HIV from positive individuals through the use of a variety of strategies with measurable outcomes. Dependent variables measured included condom use (N=6), contraceptive use (N=1), partner notification (N=4), decreased substance abuse (N=3), decreased number of sexual partners (N=1), safer sexual practices (N=6), decreased emotional distress (N=1), and decreased STD rates (N=1).

The timing of outcome measurements varied from 1 month (Belcher et al., 1998) to 18 months (Fogarty et al., 2001) after the intervention. Sixty percent of the studies measured outcomes six months after the intervention; fifty percent of the studies measured outcomes on multiple occasions. DeRosa and Marks (1998) and Kilmarx, Hamers, and Peterman (1998) did not specify outcome measurement timing.

Nine of the ten studies used more than one intervention strategy. All nine of the studies showed a significant increase in condom use, safer sexual practices, or partner notification. However, the Cleary et al. study (1995) showed no significant increase in condom use after the one-year follow-up. In contrast, the Fogarty et al. (2001) study showed a significant increase in condom and contraception use only after the six-month follow-up. The study by Otten (1993) resulted in a significant decrease in STD rates. In addition, the study by Kelly et al. (1993) showed a significant decrease in substance abuse and emotional distress. It is noteworthy that the above outcome measurements were at different times, ranging from 1 month to 18 months following the interventions.

Substance abuse was measured in three studies (Greenberg and Johnson, 1996; Kelly et al., 1993; Rotherman-Borus et al., 2001). These studies implemented 8 to 52 sessions that were 1.5 to 2 hours in duration. As a result of these lengthy and frequent interventions, these studies showed a significant decrease in substance abuse three to nine months after the intervention.

By using a combination of strategies, it was not possible to tease out the individual strategy effectiveness. Only one study, Greenburg and Johnson (1996), used counseling as the sole intervention strategy, which was mentioned in the research literature as one of the preferred strategies (Marks et al., 1999; Shumaker et al., 1998). The study showed a significant decrease in substance abuse and an increase in condom use, partner notification, and safer sexual practice at a six-month follow-up.

The topic of sharing serostatus with sexual partners was a common one (Cleary et al., 1995; DeRosa & Marks, 1998; Greenberg & Johnson, 1996; Kalichman et al., 2001; Otten et al., 1993). Those who were counseled on the importance of sharing their serostatus had higher rates of condom use and an overall decrease in risky behaviors. Greenberg and Johnson (1996) was the only study that utilized counseling as the sole interventional strategy; the other three studies utilized at least one other strategy, making the effects of individual strategies difficult to determine. The topic of co-infection was

also discussed (Cleary et al., 1995; Kalichman et al., 2001). Because of high risk for viral cross contamination and STD infection, these studies taught the subjects that two HIV positive people in a monogamous relationship avoiding condom use is not considered "safe sex." The implementation of these interventions resulted in higher condom use and safer sexual practices among the subjects.

*Behavior- Based Theories That Support Effective Interventions*

All but one of these studies was structured around a behavioral theory or concept, such as the Social Cognitive Theory (N=5), the Health Belief Model (N=1), Prochaska's Stages of Change Model (N=1), the Theory of Reasoned Action (N=2), and the AIDS Risk Reduction or Information Motivation Belief (IMB) Skills Model (N=3). The most common concept mentioned in the research was self-efficacy, which was mentioned in eight of the ten articles. Other concepts mentioned in the research studies included self – sufficiency and assertiveness/ negotiation training.

The SCT was mentioned as the intervention framework in five of the articles (Belcher et al., 1998; Cleary et al., 1995; Kalichman et al., 2001; Kelly et al., 1993 & Rotherman- Borus et al., 2001). All of these articles showed a significant reduction in risk behaviors such as increased condom use, fewer sexual partners, and less substance abuse immediately following the intervention. The Cleary et al. (1995) study showed no significant decrease in condom use or increase in partner notification after the one-year follow-up. Self- efficacy is a concept encompassed within the SCT and was mentioned independently in three other articles as an effective component of risk reduction counseling (Fogarty et al., 2001; Greenberg & Johnson, 1996 & Kilmarx, Hamers & Petermen, 1998). Overall, the Social Cognitive Theory proved to be an effective behavior-based theory in which to support an intervention aimed at reducing secondary HIV transmission.

Another commonly used theory in secondary HIV transmission prevention was the AIDS Risk Reduction or Information Motivation Belief (IMB) Skills Model.

Kilmarx, Hamers, and Peterman (1998) and Otten et al. (1993) supported their studies with this single theory and demonstrated it to be quite successful in supporting this type of behavioral intervention. Belcher et al. (1998) used this theory along with the SCT to support their intervention, which yielded significant outcome measurements.

Fogarty et al. (2001) used the Health Belief Model as the behavioral-based theory along with four other concepts or theories which makes determining its level of efficacy difficult. One of the additional theories used in this study was the Theory of Reasoned Action, which was also used in the Kalichman et al. (2001) study. These studies had significant results; however, their use of multiple concepts or theories makes study replication and validity assessment difficult.

Fogarty et al. (1997) discussed the use of Prochaska's Stages of Change Theory, which determines where a patient stands in the process of change. Understanding the patient's stage of change is helpful in determining if the intervention will be effective; if a patient has not entered the pre-contemplation stage, there is a good chance that no intervention will be successful. This study did not mention the subject's stage, however, which makes study replication and determinations of study validity difficult.

The descriptive cross-sectional study by DeRosa and Marks (1998) was the only study that made no mention of a specific concept or theory. This study focused on patient recall of HIV counseling at the time of their HIV test. It was then determined if their reported counseling, or lack thereof, made a significant difference in their behavior. This study concluded that any type of counseling had a significant impact on safer sexual practices. The study also concluded that HIV positive individuals who shared their serostatus with their sexual partners were more likely to use condoms than those individuals who did not discuss their HIV status.

From this review, it appears that an effective intervention aimed at decreasing secondary HIV transmission can be supported with a single behavior-based theory or a combination of behavior-based theories. Four of the studies successfully supported their

interventions with the use of a single theory; four of the studies successfully supported their interventions with a combination of theories.

### Discussion

Each of the ten studies available for this review sampled populations from large urban cities. Results of these studies need to be interpreted with caution when applied to populations from smaller, rural areas or other smaller urban cities. Further research on these types of population is recommended.

Four of the studies were completely or predominantly male, while two of the studies were completely female. Although gender specific interventions cannot usually be generalized to the entire population, results of these studies were similar regardless of the subject's gender.

Fifty percent of the studies used more than one theory or concept, which made it difficult to determine the effects of each theory independently. Focusing future research on interventions derived from single theory would allow for better determination of individual theory effectiveness. All of the studies, with the exception of the Greenburg and Johnson (1996) study, used more than one intervention strategy as well. This makes determining the most effective strategy difficult, but proves the combination approaches used here will be successful. Study replication and validity assessment was made difficult due to the mixture of theories and strategies utilized. However, regardless of the specific theory or strategy, theory-based behavioral interventions aimed at preventing HIV secondary transmission were shown to be an effective method of risk reduction among HIV positive individuals. Future research might also focus on the use of single intervention strategies to determine contribution of each intervention to the outcomes of interest.

Some of studies were limited due to the lack of detailed description regarding the duration of the actual interventions. The duration of the interventions ranged from five minutes to two hours. Four of the studies made no mention of the intervention duration.

However, interventions with a specified duration appeared to be equally effective whether "brief" or up to two hours in duration. Outcomes were measured 1 month (Belcher et al., 1998) to 18 months (Fogarty et al., 2001) after the intervention. Results of these studies did not always directly correlate intervention duration and frequency with outcome measurement timing. Belcher et al. (1998) implemented one brief session and measured outcomes three months post intervention; Kelly et al. (1993) implemented eight sessions lasting one and a half hours and also measured outcomes three months post intervention. Future research should specify the exact intervention duration in order to make replication easier.

Complex issues, such as substance abuse, are likely to require interventions longer in duration and higher in frequency. For example, the intervention used by Greenburg and Johnson (1996) included 52 sessions lasting 1.5-2 hours in duration; the intervention used by Rotherman- Borus et al. (2001) included 23 sessions lasting 2 hours in duration. Both of these studies showed a significant decrease in substance abuse as well as an increase in other safe sex practices. Future research is needed to determine the duration of interventions needed to successfully change long-term behavior. Healthcare providers need to know the duration and outcome measurement timing of effective interventions due to their limited time spent available to be spent with each patient. It is important to get the greatest effect out of the shortest timeframe for most providers.

It is also important for future research to address long-term follow-up, which is necessary in order to measure the efficacy of this type of intervention over time. The significance of the results is likely to change over time (Shumaker et al., 1998). Cleary et al. (1995) addressed the concept of behavioral change and safe sex practices decreasing over time; they measured condom use one year post intervention and found no significant increase in condom use at that time. In contrast, Fogarty et al. (2001) studied behavioral change over an 18-month period, finding that significant behavioral change takes place only after 6 months of an intervention; this behavioral change was maintained through

the 18-month follow-up. A possible explanation for these contrasting results could be that Cleary et al. (1995) incorporated six sessions while Fogarty et al. (2001) incorporated an unlimited number of sessions over a six-month period. These results support the theory that longer duration and higher frequency may sustain significant behavioral change over a longer period of time. The majority of these studies showed significant results after the six-month follow-up, but results were inconsistent after that time. More longitudinal studies are needed to track long-term efficacy of behavioral interventions. Frequent follow-up with possible booster sessions may be beneficial to reiterate the intervention message and maintain long-term behavioral change.

A limitation to this study is the author's inability to outline a specific evidenced-based secondary prevention intervention for healthcare providers to use in the future. Some of the studies in the research literature were contradictory and reported a wide variety of outcome measurement, making interpretation difficult. However, the results of this review can give valuable guidance to healthcare providers.

All healthcare professionals should keep in mind the following:

- Interventions can be effective at a minimum of a three month follow-up whether “brief” or longer duration
- Effective interventions can include a combination of strategies based on education, counseling, and skills training; it is unknown if single strategies are as effective
- Effective interventions can be supported by a single behavior-based theory or a combination of behavior-based theories
- Effective theory-based interventions can significantly reduce unsafe sexual practices, substance abuse, emotional distress, the number of HIV negative partners, and STD rates
- Effective theory-based interventions can consistently increase condom/ contraceptive use and partner notification for up to six months after the intervention

Appendix

Preventing HIV Secondary Transmission Data Collection Tool

Author(s):

Year of publication:

Location of research:

Sample size:

Sample characteristics:

Research design:

Theory/ concept:

Independent variable/ intervention:

Dependent variable/ outcome:

Threats to internal and external validity:

Table 1  
Study Characteristics

<i>Author/ Year</i>	<i>Location of Study</i>	<i>Sample Size</i>	<i>Sample Characteristics</i>	<i>Research Design</i>
Belcher et al., 1998	Atlanta, GA	<i>N= 74</i>	Women only Mean age 34.9 years 95% AA, 5% W 78% HIV -, 18% HIV +, 4% unknown	Randomized experimental
Cleary et al., 1995	New York City, NY	<i>N= 271</i>	Predominantly male Mean age 32.1-32.3 years	Randomized cohort
DeRosa & Marks, 1998	Los Angeles, CA	<i>N= 255</i>	Mean age 37.2 years 43% L, 40% W, 17% AA	Descriptive cross sectional
Fogarty et al., 2001	Baltimore, MD and Philadelphia, PA	<i>Baltimore N= 322</i>  <i>Philadelphia N= 1,289</i>	Women only Mean age 18-44 years	Quasi- experimental
Greenberg & Johnson, 1996	Atlanta, GA	<i>N= 100</i>	77% male Mean age 23-51 years 93% AA	Descriptive correlation
Kalichman et al., 2001	Atlanta, GA	<i>N= 328</i>	230 men, 98 women Mean age 40.1 years 74% AA, 22% W, 4% O	Randomized experimental

Notes: AA= African American, W= White, L= Latino, O= Other, HIV -= HIV negative, HIV += HIV positive

Table 1  
Study Characteristics

<i>Author/ Year</i>	<i>Location of Study</i>	<i>Sample Size</i>	<i>Sample Characteristics</i>	<i>Research Design</i>
Kelly et al., 1993	Milwaukee, WI	<i>N= 68</i>	Male only Mean age 34 years 62% W, 20% AA, 9% O	Randomized experimental
Kilmarx, Hamers, & Peterman, 1993	Baltimore, MD; Miami, FA; and Newark, NJ	<i>N= 142</i>	57% male 82% AA	Retrospective descriptive
Otten et al., 1993	Miami, FA	<i>N= 997</i>	331 HIV + 666 HIV -	Historical cohort
Rotherman- Borus et al., 2001	Los Angeles, CA; New York City, NY; San Francisco, CA; and Miami, FA	<i>N= 310</i>	Mean age 13-24 years 27% AA, 37% L	Randomized cohort

Notes: AA= African American, W= White, L= Latino, O= Other, HIV -= HIV negative, HIV += HIV positive

Table 2  
Study Findings

Author/ Year	Independent Variable/ Intervention	Theory/ Concept	Dependent Variable/ Result	Threats to Internal and External Validity
Belcher et al., 1998	1 session: “brief” Education Counseling Skills training	Social Cognitive Theory AIDS Risk Reduction Model (IMB)	+ S Condom use at 1 month + S Condom use at 3 months	Women only Small N 78% HIV negative Did not state the duration of the counseling session
Cleary et al., 1995	6 sessions: 1.5 hours Education Counseling Skills training	Social Cognitive Theory	+ S Condom use at 6 months NS Condom use or partner notification at 1 year	38% of Exp group attended 2 sessions Authors considered self- reporting of serostatus in “monogamous” relationship unreliable
DeRosa & Marks, 1998	Recall of HIV counseling to 1 of 4 categories: posttest only, clinic only, posttest and clinic, or none: * Education Counseling	No citation listed	+ S Partner notification + S Safer sexual practices **	Reporter bias from past experiences  Does not explore the nature of the counseling
Fogarty et al., 2001	Data from 6 months: * Education Counseling Skills training	Self-efficacy Theory of Reasoned Action Health Belief Model Prochaska’s Stages of Change Theory Negotiation/ Assertive training	NS Condom or contraceptive use at 6 months + S Condom & contraceptive use at 12 and 18 months	All women  Did not state the duration and frequency of counseling sessions; no limit to the frequency of sessions
Greenberg & Johnson, 1996	52 sessions: 1.5-2 hours Counseling	Self-efficacy Self-sufficiency	+ S < Substance Abuse + S Partner notification + S Condom use + S Safer sexual practices at 6 months	Predominantly male and AA  50% attended all of the sessions

Notes: + S= significant results, NS= no significant results; HIV += HIV positive, HIV-= HIV negative. \*= no intervention duration noted; \*\*= no follow up time frame noted

Table 2  
Study Findings

Author/ Year	Independent Variable/ Intervention	Theory/ Concept	Dependent Variable/ Result	Threats to Internal and External Validity
Kalichman et al., 2001	5 sessions: 2 hours Education Counseling Skills training	Social Cognitive Theory Theory of Reasoned Action	+ S Condom use & safer sexual practices at 3 months and decreased at 6 months but still + S	78% completed all sessions  Reliance on self-reporting  Paid \$10 per session plus \$35 at time of completion
Kelly et al., 1993	8 sessions: 1.5 hours Education Counseling	Social Cognitive Theory	+ S < substance abuse + S Safer sexual practices + S < emotional distress at 3 months	All men  All subjects had known history of depression  Relatively small N
Kilmarx, Hamers, & Peterman, 1998	1 session: * Education Counseling	AIDS Risk Reduction Model (IMB)	+ S Condom use + S Partner notification + S Safer sexual practices **	Self-reporting retrospective  No mention of counseling duration or frequency
Otten et al., 1993	1 session: * Education Counseling	AIDS Risk Reduction Model (IMB)	+ S < STD rates + S Partner notification at 6 months	30% of the sample HIV –  Only measured rates of STDs
Rotherman- Borus et al., 2001	23 sessions: 2 hours Education Counseling Skills training	Social Cognitive Theory Negotiation/ Assertive training	+ S < unprotected sex + S < sexual partners + S < HIV – partners + S < substance abuse at 6 months and 9 months	Adolescents only  58% completed the program

Notes: + S= significant results, NS= no significant results; HIV += HIV positive, HIV-= HIV negative. \*= no intervention duration noted; \*\*= no follow up time frame noted

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