Review

Impact of interventions promoting condom use among HIV-infected individuals

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Keywords

Abstract
In order to identify educational interventions promoting male condom use during intercourse among HIV+ persons, we conducted a systematic review of publications. Lilacs/Bireme, Medline and Popline data sets and CDC and UNAIDS sites were searched without time limit. Uniterms used were: women; men; interventions; HIV; Aids; HIV positive; risk behaviors; sexual risk behaviors; and intervention studies. Fourteen interventions were included, eight of which reported a positive result. Most frequent methodological weaknesses observed were lack of randomization, no control for confounding, high rates of losses to follow-up, small sample sizes, and outcome of condom use stated by patient self-report. Publication bias favoring studies showing a beneficial effect has to be considered. Effective interventions aiming to promote condom use among HIV positive persons are currently an important tool in the prevention of HIV dissemination.

INTRODUCTION

The acquired immunodeficiency syndrome (AIDS) is a challenge in terms of control and treatment. In December 2001, an estimated 40 million people carried the Human Immunodeficiency virus worldwide, of which 18.5 million were women. With the increase in the number of cases classified as of heterosexual transmission, the contamination of women is on the rise. Almost one-half of the four million persons infected in 2001 were women. A large share of these women are contaminated between ages 15 and 24 years, at the height of their reproductive lives, thus leading to an increase the number of cases among children due to mother-to-child transmission. In Latin-America, there are about 1.5 million HIV+ persons, and 28% of HIV+ adults are women. According to the Brazilian Ministry of Health, it is estimated that the number of HIV+ persons in Brazil is in excess of 500 thousand. Between 1980 and December 2002, more than 250 thousand cases were registered in the country, of which 28% were women. In 2001, the male-to-female ratio among AIDS cases was 1.7. With the advent of antiretroviral therapy, there has been an improvement in the quality of life of HIV+ persons. In Brazil, antiretroviral therapy is offered free of charge by the Ministry of Health, which has led to an increase in patient survival. Prevention measures are thus becoming increasingly important among identified HIV+ persons. Moreover, acquiring other STDs (Sexually Transmissible Diseases) makes reductions in immunity more likely among HIV+ patients, and failure to use condoms with seropositive partners prevents an adequate control of viral load and increases risk of contamination by antiretroviral-resistant strains.

Condoms are among the most important weapons in the battle against AIDS. Laboratory and epidemiological studies have proved the effectiveness of condoms against a wide range of STDs, including gonorrhea, nongonococcal urethritis, trichomoniasis, and genital herpes, as well as against HIV contamination. On the other hand, data from the literature also show that awareness of being HIV+ does not necessarily imply using condoms in all sexual relations, even with uninfected

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partners with partners whose serological status is not known. However, a bibliographic review conducted in 1993 concluded that the existing evidence strongly support the efficacy of educational measures promoting condom use in the reduction of the transmission of HIV and other infections.13

The present article is a review of publications that describe educational interventions directed towards HIV+ persons, whose measured outcome was the use of male condoms.

**METHODOLOGICAL PROCEDURES**

The Lilacs, Medline, and Popline databases and the Center for Disease Control and Prevention and UNAIDS websites were searched, without time limit. The following Uniterm combinations were used: (women/men and interventions), (women/men and HIV and interventions), (women/men and AIDS and intervention studies), (women/men and HIV positive and intervention studies), (women/men and HIV positive and intervention studies and risk behaviors), (women/men and HIV positive and intervention studies and sexual risk behaviors), (HIV positive and interventions), (women/men and HIV), (women/men and AIDS), (interventions and AIDS), (HIV positive and sexual risk behaviors and intervention studies).

Initially, the studies returned were manually inspected, removing interventions aimed at non-HIV+ persons, clinical and perinatal interventions among HIV+ persons, educational interventions not related to sexual behavior, and descriptive studies. After the initial inspection, all articles identified were read in full and those pertinent to the subject were selected. We identified and obtained 10 articles from the Medline database, of four were pertinent to the review. From the Popline database, we obtained 15 articles, of which two were selected. No articles were identified in the UNAIDS website or in the Lilacs/Bireme database. A single reference was found in the CDC website, but was discarded.

We checked the references of all articles read, including those discarded. We identified 29 references, of which eight were included in the review. In total, 14 articles were included in the review.

We included only studies evaluating interventions aimed at HIV+ persons, whether randomized or not, whose measured outcome was the use of male condoms. No studies were rejected based on methodological limitations. Instead, we describe all limitations in Table. Articles fulfilling all inclusion criteria were evaluated and rated according to the 27 criteria proposed by Downs & Black.3 Briefly, we evaluated clarity in the description of:

1. study hypotheses, aims, and objectives;
2. main outcomes measured;
3. characteristics of the patients included;
4. interventions of interest;
5. distributions of principal confounders in each group of subjects to be compared;
6. main findings of the study;

Other items evaluated were:

7. whether the study provides estimates of the random variability in the data for the main outcomes;
8. whether adverse effects were reported;
9. whether the characteristics of patients lost to follow-up were described;
10. whether probability values were reported for the main outcomes;
11. whether the sample of subjects invited to participate in the study was representative;
12. whether the sample of subjects included in the study was representative;
13. whether the staff, patients, and facilities where the patients were treated were representative of the treatment the majority of patients receive;
14. whether an attempt was made to blind patients to the type of intervention;
15. whether an attempt was made to blind patients to the outcomes;
16. if any of the results were not based on a priori hypotheses whether this was made clear;
17. whether, in trials or cohort studies, the analysis adjusts for different lengths of follow-up of patients, or, in case-control studies, the time period between intervention and outcome is the same for cases and controls;
18. whether the statistical tests made to assess the main outcomes were appropriate;
19. whether compliance with the intervention was adequate;
20. whether the main outcome measures used were accurate;
21. whether the patients in different intervention groups were recruited from the same population;
22. whether the patients in different intervention groups were recruited over the same period of time;
23. whether randomization took place;
24. whether randomization occurred until recruitment was complete;
25. whether the analysis included adequate control for major confounders;
26. whether losses of patients to follow-up were taken into account;
27. whether the study had sufficient power to detect an important effect with a 5% significance level.
Item eight, concerned with the measurement of potential side effects, was removed, since it is unlikely that educational interventions have harmful effects. Evaluation of the studies.

**STUDIES EVALUATION**

The methodological aspects and the results of the 14 studies that evaluated interventions aimed at increasing condom use among HIV+ persons are described in the Table.

Mean methodological score was 14.6 points (SD: 4.8), with five studies scoring less than 14 points and seven studies scoring above the mean. The highest-scoring study was that of Kalichman et al. The first intervention took place in Zaire. Kamenga et al. applied an educational intervention, without a control group, to 168 discordant couples. Couples were identified through systematic HIV testing of the employees of a factory and a bank. Both individual participants and couples received counseling on STDs, HIV, and condom use. During monthly visits, the researchers provided the couple with condoms and with a sexual activity calendar, to be filled separately by each of the members of the couple. Participants were also asked to keep condom packages, which were checked at each visit. The increase in consistent condom use (use in 100% of sexual relations) after 18 months was greater than 70 percentage points. Condom use did not vary with socioeconomic status or place of employment, and was greater among couples in which the man was seronegative. The incidence of seroconversion was low, as was that of STDs, and there was a good correlation between sexual history and the number of packages presented.

A study carried out in Ruanda in 1992 randomly selected women aged 20–40 years form an antenatal and pediatric outpatient facility. Women were tested for HIV and two groups were formed: HIV+ (460) and HIV- (998). Both groups participated in a group discussion with 10-15 members, including a video presentation, and were provided with condoms and spermicide. Follow-up consisted in semestral visits to the service, when gynecological exams, treatment of gonococcus culture-positive women, and condom and spermicide distribution were carried out. After a one-year follow-up period – in comparison with a control group comprising 208 women selected for a cross-sectional study – there was a 31.5% difference in self-reported consistent condom use in favor of the intervention group. Prevalence of condom use was 3.5%, among controls and 35% among HIV+ intervention subjects (p<0.05). The rate of condom use was higher among discordant couples. Predictors of condom use among HIV+ women included non-monogamous relationships, believing in the inexistence of adverse effects, and partner engaging in intercourse with sex workers.

Allen et al. applied an intervention to 153 discordant couples. The control group consisted of 838 women with partners of unknown serological status. The intervention consisted of an educational video, group discussions, and distribution of condoms and spermicide. Intervention and control-group subjects returned to the clinic every three months and underwent annual medical examination. There was a 53% increase (p<0.001) in consistent condom use in the intervention group after a one-year follow-up period. The rate of seroconversion was low. The conversion rate among intervention-group women was below half the rate estimated for the women with partners of unknown serological status. Among men who seroconverted, condom use was significantly lower and alcohol use was reported more frequently. The illiteracy rate was higher among women who seroconverted. Condom use was more frequent when the man was HIV-.

Another study carried out in the United States provided counseling during medical appointments in reference services for 61 HIV+ patients of both sexes. Most patients belonged to ethnic minorities and mean age was 35 years. No difference was observed in condom use with regular partners. The study lacked a control group and behavioral data were collected after the test. The study report was very brief and the authors did not describe the definition of ‘condom use’ (consistent, in last intercourse, and others) used as an outcome.

In a ‘before-after’ study among HIV+ men diagnosed with depression, patients were divided into three groups: the first group, with 39 subjects, was offered eight cognitive-behavioral group sessions; the second group, with 38 subjects, eight social support group sessions; and the control group, with 38 patients, received only individual therapy sessions during crises. After three months, the authors evaluated the frequency of unprotected insertive and receptive anal intercourse. Significant changes were observed in the control group, with a reduction in unprotected insertive anal intercourse (p<0.05). In the second intervention group, the effect in terms of unprotected receptive anal relations obtained borderline significance (p<0.06). Intra-group differences were significant among the second intervention group and among controls for insertive anal intercourse (p<0.001); and among the second intervention group only for receptive anal relations (p=0.008).
<table>
<thead>
<tr>
<th>Autor/year/ country</th>
<th>Initial and final N</th>
<th>Sample</th>
<th>Intervention/ control</th>
<th>Outcome</th>
<th>Results</th>
<th>Score</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kamenga et al., 1991, Zaire</td>
<td>I: 168; 149</td>
<td>Discordant couples</td>
<td>Individual and couple counseling; handing out of condoms and medication</td>
<td>Condom use in all intercourse after 18 months</td>
<td>Initial: &lt;5% 18 m; 77.4% Dif: 72.4 percentage points</td>
<td>10/26</td>
<td>Analyzed only those evaluated for 6 months or longer; transportation subsidies given; visits to absentees.</td>
</tr>
<tr>
<td>Allen et al., 1992, Ruanda</td>
<td>C: 208</td>
<td>HIV+ women, 20-40 years, Random sample of outpatients</td>
<td>Video presentation group and discussion; handing out of condoms; voluntary participation of partners</td>
<td>Reported condom use after 1 year</td>
<td>l: 35.0%; C: 3.5% Dif: 31.5 p.p. p&lt;0.05</td>
<td>15/26</td>
<td>No confounder control; not randomized; not blinded; controls recruited after the end of the study,</td>
</tr>
<tr>
<td>Allen et al., 1992, Ruanda</td>
<td>C: 838; 608</td>
<td>Discordant couples, Controls women with partners of unknown serology</td>
<td>Educational video presentation and group discussion; handing out of condoms</td>
<td>Condom use for one year</td>
<td>l: 57%; C: 4% Dif: 53 p.p. p=0.001</td>
<td>18/26</td>
<td>Household visits to absentees Free medical care.</td>
</tr>
<tr>
<td>CDC, 1993, EUA</td>
<td>I: 61; 7</td>
<td>HIV+ persons attending reference services</td>
<td>One-session counseling</td>
<td>Mean follow-up of 6 months</td>
<td>No dif. with regular partners</td>
<td>05/26</td>
<td>Short publication (bulletin); no control group; small sample with limited power; no control for the degree of the disease; data collection after post-test.</td>
</tr>
<tr>
<td>Kelly et al., 1993, EUA</td>
<td>I: 39; 27 C: 38; 14</td>
<td>HIV+ men diagnosed with depression</td>
<td>I: 8-session cognitive-behavioral group I2: 8-session support group C: free individual therapy during crises</td>
<td>N unprotected Insertive Anal intercourse Initial(A); After 3 months(D)</td>
<td>I 1 A: 1.6(4.2) D: 2.9(10.2) I 2 A: 0.6(0.4) D: 0.0(0.0) C A: 0.3(0.7) D: 0.1*(0.4)</td>
<td>14/26</td>
<td>Before-after design; 41% losses Most losses among severe patients.</td>
</tr>
<tr>
<td>Padian et al., 1993, EUA</td>
<td>I: 144; 62</td>
<td>HIV+ persons and heterosexual partners</td>
<td>Individual and couple counseling sessions</td>
<td>Consistent condom use after 1 year</td>
<td>Initial: 49% 1 year 90% Dif: 41 p.p. p=0.001</td>
<td>11/26</td>
<td>No control group; small sample with limited power; substantial losses; self-reported measurements; more stable couples.</td>
</tr>
<tr>
<td>Cleary et al., 1995, EUA</td>
<td>I: 135; 91 C: 136; 106</td>
<td>271 HIV + blood donors.</td>
<td>I: support group C: available medical and psychological services</td>
<td>% unsafe sex in last week; after 1 year</td>
<td>Beginning: l: 57%; C: 71.7% Dif: 14.7 p.p. p=0.03 Follow-up: l: 30.9%; C: 37.7% Dif: 6.8 p.p. p=0.3</td>
<td>21/26</td>
<td>Randomized; effectiveness study; described losses and potential confounders.</td>
</tr>
<tr>
<td>Greenberg et al., 1996, EUA</td>
<td>I: 116; 100</td>
<td>HIV+ drug users, entering a community support group</td>
<td>I: weekly group session lasting 1.5-2 hours with 25-30 members and e 2 facilitators</td>
<td>Consistent condom use after 6 months</td>
<td>Beginning: 60% Follow-up: 79% Dif: 19 p.p. p=0.001</td>
<td>11/26</td>
<td>No control group; self-reported measurements.</td>
</tr>
</tbody>
</table>
Table - Continuation.

<table>
<thead>
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<tr>
<td>Parsons et al, 2000, EUA</td>
<td>M: 255; 154; W:158; 87</td>
<td>HIV+ hemophiliacs men aged 18+ years and their sexual partners</td>
<td>I: Based on the transtheoretical model; C: partial or no intervention</td>
<td>Consistent condom use after 3 months</td>
<td>Men with partners: 68%; Men without partners: 22%; Partners: 69%; Non-significant major effect</td>
<td>14/26</td>
<td>Quasi experimental; self-administered questionnaire; no differentiation between controls and intervention group.</td>
</tr>
<tr>
<td>Fogarty et al, 2001, EUA</td>
<td>I: 164; 117; C: 158; 125</td>
<td>HIV+ women aged 18-44 years</td>
<td>I: Individual and group care; C: routine and emergency appointments</td>
<td>Progress in condom use with main partner after 18 months</td>
<td>Progress in relation to controls: OR: 2.3</td>
<td>17/26</td>
<td>Randomized; losses between 21 and 42%; sample similar to HIV clinical scenario; paid US$20.00/ interview; 'intent to treat' analysis.</td>
</tr>
<tr>
<td>Gien et al, 2001, EUA</td>
<td>I: 40; 7; C: 30; 7</td>
<td>Sub-sample with main sexual partner at baseline and follow-up</td>
<td>Progress in condom use with main partner after 6 months</td>
<td>Progress in relation to controls: OR: 2.67</td>
<td>20/26</td>
<td></td>
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<tr>
<td>Grinstead et al, 2001, EUA</td>
<td>I: 94; 61; C: 29; 20</td>
<td>HIV+ prison inmates to be released in 6 months</td>
<td>I: series of 8 sessions in two consecutive weeks</td>
<td>Condom use in first intercourse after release</td>
<td>I: 81%; C: 68%; Diff: 0.30 (Cohen h)</td>
<td>11/26</td>
<td>Low statistical power.</td>
</tr>
<tr>
<td>Kalichman et al, 2001, EUA</td>
<td>I: 185; 141; C: 143; 110</td>
<td>HIV+ men and women recruited from AIDS and infectious disease services</td>
<td>I: 5-session groups based on the Social Cognitive Theory; C: 5-session support group</td>
<td>% condom use in vaginal and anal sex with all partners after 6 months</td>
<td>Beginning: I: 75.5%; C: 57.1%; Diff: 17.1 p.p.</td>
<td>22/26</td>
<td>Randomized.</td>
</tr>
<tr>
<td>Rotheram-Borus et al, 2001, EUA</td>
<td>I: 208; 124; C: 102; 30</td>
<td>HIV+ youths aged 13-24 years seen at 9 clinics</td>
<td>23 group sessions divided into 2 modules (6 months), based on the 'Social Action' model</td>
<td>% unprotected intercourse (after module II)</td>
<td>I: 2.8%; C: 15.5%; Diff: 1.7 p.p.</td>
<td>15/26</td>
<td>Groups designed in sequence; charged for sessions; 15-month follow-up.</td>
</tr>
</tbody>
</table>

I: intervention; C: control; W: women; M: men; Dif: difference
*p=0.05
suggest that one of the reasons behind the ineffec-
tiveness of the intervention may be the high avail-
ability of alternative medical services in the area where
study was conducted.

In the study by Greenberg et al11 (USA), the inter-
vention was administered to 116 HIV+ drug users
upon entry to a community support group. There was
no control group. Seventy-seven percent of partici-
pants were men and 93% were African-Americans.
Age ranged between 25 and 31 years. Groups met
weekly, sessions lasting for one-and-a-half to two
hours. The groups were composed of 25-30 members
and two facilitators. The aim was to strengthen par-
ticipants so that they become self-sufficient, adopt
healthy lifestyles, and develop interpersonal relation-
ships that eliminate the need for risk behaviors. The
greatest focus was placed upon drug addiction and
safety in drug use. Patients received transportation
and food subsidies and were paid to give interviews.
There was a 19% increase in consistent condom use
(p=0.001). An increase was also seen in the use of
condoms with fixed and casual partners. There was
no significant association between the number of
sessions attended or treatment for drug addiction and
increased condom use. The authors suggest that
groups of this sort should place greater emphasis on
safe sex practices and on HIV prevention, and em-
phasize the low cost of this type of intervention.

An intervention based on the transtheoretical model
was used by Parsons et al19 (USA), in 255 HIV+ hem-
ophiliac men and their sexual partners (158). The study
was conducted in 15 American states, and included
multiple hemophiliac treatment facilities and organi-
zations. The approach offered to the intervention
group was divided into two components: communi-
cation skills (three modules, totaling three to four
hours in average); and observation of the subject’s
stage of change, with the administration of activities
based on this stage (one hour each). The intervention
lasted one year, was usually in group but individual
at times, and follow-up was carried out three months
after the end of the intervention. Controls received
either a partial or no intervention. Score results were
measured by interaction. The effect of the interven-
tion on consistent condom use was not significant.
Among men, there was a significant increase in safe
sexual behaviors. Women in the intervention group
reported greater condom use by their male partners
during last vaginal intercourse (OR=6.92; p=0.01).

Fogarty et al9 (USA) conducted a randomized study
among HIV+ women aged 18-44 years. Participants
were recruited from clinics and outpatient treatment
facilities for HIV+ persons, pediatric hospitals for
HIV+ mothers, and through reference of participants
and healthcare agents. Women in the intervention
group (164), in addition to the regular care provided
to controls (158), were provided with theoretically-
based care by trained HIV+ individuals. Care was pro-
vided individually and in groups, and focused on the
following behaviors: use of condoms with main part-
tner, use of condoms with other partners, and use of
contraceptives. Interviews were paid (US$20 each)
and evaluated demographic, risk-related, and behav-
ioral (stage of change, self-efficacy, and advantages
and disadvantages of condom use) data. Patients were
followed for 18 months after the intervention. A
progress in use of condoms with main partner was
seen in the patients of the intervention group
(OR=2.3; p=0.02). The study by Gielen10 was a
subanalysis of this same study, and included only
women with a fixed partner at the beginning of the
study and six months after the intervention. This study
included 40 women from the intervention group and
30 from the control group. Progress in condom use
with main partner among women in the intervention
group showed an odds ratio of 2.67 (p=0.04).

Also in the United states, Grinstead et al12 con-
ducted an intervention aimed at HIV+ prison inmates
scheduled to be released in six months. A total 94
men received the intervention and were compared to
29 controls – also prison inmates – that refused to
participate in the intervention sessions. Each partici-
pant attended eight sessions lasting between two and
two-and-a-half hours in two consecutive weeks. These
sessions included information on HIV, treatment, drug
use, sexuality, and nutrition, among other subjects.
In addition, these subjects were referred to commu-
nity treatment centers, financial assistance, programs
for alcohol and drug addicts, and educational and
vocational training. The outcome investigated was
use of condoms during first intercourse after release.
Indeed, reported condom use in the intervention
group was 81%, versus 68% in the control group, but
this difference was not statistically significant.

Another randomized study was conducted by
Kalichman et al (USA).14 HIV+ subjects of both sexes
were recruited from AIDS and infectious disease fa-
cilities. The intervention group (185) participated in
a five-session group intervention, based on the So-
cial Cognitive Theory, focusing on strategies for prac-
ticing safer sex. The control group was offered a five-
session health management support group. Six months
after the intervention the percentage of consistent
condom use during anal and vaginal intercourse with
all partners was greater among the intervention group
(p=0.05). The lower rates of anal and vaginal inter-
course in the intervention group were also signifi-
Finally, a study conducted in the United States by Rotheram-Borus et al. evaluated the impact of an intervention among HIV+ youths seen at clinics of four American cities. The intervention group, comprising 208 subjects, underwent 23 small-group sessions divided into two modules: ‘Stay Healthy’ and ‘Act Safe.’ The intervention was based on the ‘Social Action’ model, and each module lasted for three months. The control group (102 subjects) received the regular care provided by the services. After Module I, more positive lifestyle changes were seen among the women in the intervention group. After Module II, the youths in the intervention group reported 82% fewer unprotected sexual acts; 45% fewer sexual partners; 50% fewer HIV- sexual partners; and 31% less substance use. There was no difference with respect to the disclosure of HIV status to sexual partner. The total cost of the intervention itself was US$980.00 per subject.

In summary, only three of the studies were randomized. Five studies lacked comparison with a control group. Follow-up time showed great variability between studies, ranging from three months to over three years. The type of intervention was also widely variable, some interventions being much longer and more elaborate than others.

Most common limitations were absence of randomization, lack of confounder control, substantial losses, lack of ‘intent to treat’ analysis, and insufficient statistical power. In addition, most studies based their evaluations of the outcome on the reports of the HIV+ subjects on their sexual practices. Concerning the results, of the 14 studies reviewed, eight showed at least some positive effect of the intervention. Results suggest a greater effect in shorter follow-up periods, of up to one year.

COMMENTS

The present review showed that, in general, the studies conducted report positive effects of educational interventions on the frequency of condom use among HIV+ persons. The results obtained by more elaborate and costly interventions were not much superior to those obtained by interventions of shorter duration and simpler execution. Comparisons between the results of the different investigations is hampered by the great variability in quality, methodology used, and outcomes measured. Study heterogeneity with respect to type of intervention, study population, and methodology prevented us from obtaining an aggregate measure through metaanalysis. A potential publication bias must be considered, since, in general, intervention studies that show beneficial effects are more likely to be published than those with null effects.

Worthy of note is the fact that most studies are based on self-reports of HIV+ persons concerning sexual behavior. The reliability of self-reported sexual behavior among adolescents was investigated by Brener et al. who conducted a test/retest study in which self-administered questionnaires were answered by 1,679 students from grades 7 to 12 with a 14-day interval. These authors reported kappa statistics of 0.71 for onset of sexual activity before age 13; 0.81 for four or more sexual partners in life; and 0.48 for four or more sexual partners in the last three months. Another validation study was carried out in order to evaluate the veracity of self-reported condom use among an urban population at high risk for STDs/AIDS. In a prospective cohort study, the authors investigated sexual events, condom use in last 30 days, risk factors, STD history, and presence of infections through laboratory exams for chlamydia, gonorrhea, syphilis, and trichomoniasis. The investigation was repeated after three months. Self-reported condom use was not associated with lower incidence of STDs. The authors concluded that self-reporting, even in research settings, may be subject to substantial information bias. Such findings suggest that, ideally, in this field, biological markers should be used in addition to the subject’s report in order to measure the effect of interventions. We speculate that this procedure is not adopted routinely by researchers due to its high cost.

It is important to keep in mind the need for establishing truly effective interventions aimed to increase condom use among HIV+ persons. Improvements in health and reductions in viral load brought about by current antiretroviral therapies may lead to a feeling of lesser need for safe sex practices, even though undetectable amounts of viral RNA do not necessarily mean that the patient is not infective. As indicated previously, investing in prevention among HIV+ persons may be more effective than investing in the general population for three reasons: 1) greater effect on the dissemination of the epidemic (cost-effectiveness); 2) the degree of preventive altruism among HIV+ persons is generally greater than the self-protective efforts of uninfected persons; and 3) there is reason to suppose that such altruism may be reinforced by appropriate interventions. A study conducted in the United States showed that, compared to women at risk, HIV+ women reported lesser sexual activity and substance use; more frequent condom use (63% vs. 28%) during vaginal intercourse; and more frequent consistent condom use during all in-
Condom use among HIV infected individuals
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Generally speaking, interventions aimed at HIV+ persons involve techniques to improve quality of life (risk behaviors are associated with stress, low self-esteem, marital dissatisfaction, and problems with alcohol and drugs) and to promote reflection upon the person’s conduct and its consequences (which has proved effective, at least among discordant couples). Authors agree that impositions and ethical or moral judgment must be avoided, and recommend that, to achieve prevention, it is necessary to promote serological testing; identify and test partners; carry out post-test counseling; improve contact with HIV+ persons, improve the quality of life of these persons; promote educational interventions in case of persistent risk behavior; and carry out cognitive interventions when feasible. In poor countries, an option would be to provide economic subsidy to HIV+ persons engaged in prostitution, so that these persons can afford to abandon this activity (cost-benefit). Simpler, less expensive, and effective alternatives should be preferred.17

Even though the efficacy of risk-reduction interventions based on cognitive-behavioral principles is widely documented in the literature, the successful dissemination of HIV prevention models from research to practice will require mechanisms for providing resources and technical assistance, especially to smaller facilities. Researchers can facilitate this process by developing interventions that consume less time and resources than the current models.7

REFERENCES


