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Review

# A role for depression in sexual risk reduction for women? A meta-analysis of HIV prevention trials with depression outcomes

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ABSTRACT

Rates of HIV/AIDS and depression in women are significant public health concerns. The current meta-analysis tested the hypothesis that depression levels moderate change in sexual risk behavior in women participating in HIV prevention interventions. Features of the interventions were also explored as possible factors in decreasing levels of depression and sexual risk behavior. Included were HIV primary prevention interventions that measured sexual risk behavior and depression at baseline and follow-up and reported separate results for women. Ten studies (fourteen intervention groups and ten control groups; N = 4,195 women) met the inclusion criteria. The majority of participants were African American; mean age was 28-years old. Both depression and sexual risk behavior decreased significantly in treatment and control groups from baseline to follow-up. Sexual risk decreased more to the extent that interventions sampled (a) participants with higher baseline levels of depression, (b) older women, (c) Hispanics/Latinas, and/or (d) members of risk groups (e.g., drug users, homeless). Interventions that included (e) condom provision, (f) information about condoms, and/or (g) HIV counseling and testing were also more successful in decreasing sexual risk. Finally (h), interventions were more likely to reduce sexual risk behavior when they decreased depression to a large extent relative to baseline levels. Interventions were more likely to decrease depression when they (a) had samples of only women, (b) targeted risk groups, and/or (c) provided self-management and coping skills. Reducing depression appears to play a role in decreasing sexual risk behavior, suggesting that interventions should actively address depression.



## Introduction

AIDS is among the leading causes of death in the United States (Heron, 2011) and the number one killer worldwide of women aged 15–44 (World Health Organization, 2009). In the United States, as of 2008, the CDC (2011b) estimated nearly 1,200,000 people living with HIV/AIDS, with approximately 48,100 new cases diagnosed in 2009, 23% of whom were women (Prejean et al., 2011). Women comprise over one-third of all people living with HIV/AIDS (CDC, 2011b) and African American and Hispanic/Latina women are disproportionately affected by HIV/AIDS, with rates about 15 and 5 times higher than white women, respectively (CDC, 2011a). Depression is also a major public health concern for women as significantly higher rates of depression are seen in women compared to men (Pratt & Brody, 2008). Risk factors for depression include financial problems, low socioeconomic status, unemployment, and lower levels of education, with ethnic/racial minority women being more likely to possess these risk factors (American Psychological Association, 2010; Lorant et al., 2003; Mossakowski, 2009). Furthermore, women who experience depression/psychological distress are more likely to report increased unprotected sex, more sexual partners, more sexually transmitted infections, more alcohol and drug use, more sex under the influence of alcohol or drugs, and more unstable housing, among other HIV risk factors (Beadnell et al., 2003; Seth et al., 2009; Williams & Latkin, 2005). Therefore, depression and its risk factors also place women at increased risk for contracting HIV.

From a theoretical perspective, it is logical to expect that depression plays a role in HIV prevention intervention outcomes for women. According to the theory of gender and power (Connell, 1987), there are three structures that illustrate gender interactions between men and women: (a) the sexual division of labor, (b) the sexual division of power, and (c) cathexis, or social norms and emotional attachment, all of which function at the societal and institutional levels. Wingood and DiClemente (2000) adapted the theory of gender and power to apply to HIV risk factors for women. In the sexual division of labor, for example, paying women less than men for similar work perpetuates a cycle whereby women are

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financially dependent upon men. The sexual division of power reflects women's disempowerment through the media portrayal of women as sexual objects. Cathexis dictates what sexual behavior is appropriate for women and portrays motherhood as a valued role. These three phenomena lead to less: ability to negotiate safe sex practices, condom use, education, power in relationships, and access to healthcare and increased homelessness in women (Wingood & DiClemente, 2000). These outcomes not only put women at risk for HIV but also for depression.

The sexual division of labor, sexual division of power, and cathexis highlight the lack of resources that some women experience in comparison to men. The network-individual-resource model (Johnson, Redding et al., 2010) elucidates how the individual functions within one or more networks to fulfill his or her needs. The individual's networks continually or intermittently interact with him or her to affect levels of resources that both the individual and network possess: (a) mental resources, including efficacy, control, intentions, skills, and attitudes and (b) tangible resources, including money, condoms, and physical health. The goal of the individual is to use the network to fulfill the deficit in resources. Therefore, network, resource, and power factors converge to put women at risk for HIV and depression. In the case of HIV, for example, if a woman has insufficient money, she may use her network to obtain this resource through commercial sex work. Deficits in mental (e.g., coping skills) and tangible (e.g., housing) resources can lead to depression, as discussed above.

Individuals who are depressed (DiFranceisco et al., 1998; Kim, Peragallo, & DeForge, 2006) and those most at risk for HIV (e.g., those who engage in high levels of sexual risk behavior; Noguchi, Albarracín, Durantini, & Glasman, 2007) are less likely to complete interventions. If depressed women are not being retained in interventions, then they cannot reap the benefits of reducing sexual risk behavior (e.g., increased condom use, decreased rates of unprotected sex, decreased number of partners; Crepaz et al., 2009; Mize, Robinson, Bockting, & Scheltema, 2002). Past meta-analyses of prevention interventions with women have shown significant decreases in sexual risk behavior (e.g., Crepaz et al., 2009; Mize et al., 2002). While these meta-analyses have taken into account some psychosocial variables (e.g., empowerment, self-efficacy), to date they have not examined how psychological functioning (e.g., depressive symptoms) plays a role in the efficacy of these interventions. Meta-analyses examining other populations (e.g., men who have sex with men, Herbst et al., 2005; adolescents, Mullen, Ramírez, Strouse, Hedges, & Sogolow, 2002) also have not specifically addressed depression within the context of HIV prevention interventions.

Drawing on these theoretical perspectives, empirical studies, and past meta-analyses, the main foci of this meta-analysis were to examine (a) how sexual risk behavior and depression levels change in women as a result of completing an HIV prevention intervention, (b) whether baseline severity of depression moderates the change in sexual risk behavior from baseline to follow-up, and (c) whether components of HIV interventions are related to decreased depression and sexual risk.

## Method

The current meta-analysis adheres to PRISMA guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009).

### *Literature search*

Relevant studies were located through several search strategies carried out by two of the authors. First, electronic databases were searched through September 1, 2010 using a Boolean search (PsycINFO, PubMED, Academic Search Premier, CINAHL, Psychology & Behavioral Sciences Collection, Women's Studies International, ProQuest Dissertations and Theses, Scopus). Keyword searches included: HIV prevention AND depression AND women; HIV prevention AND depressive AND women; HIV-women AND depress* AND HIV intervention; depression OR depressive AND HIV prevention AND women; depression OR depressive AND HIV prevention AND women AND condom. A full-text search was conducted using the University of Connecticut's Synthesis of HIV/AIDS Research Project's (SHARP) Sexual Risk Reduction database which consists of digitized reports of HIV interventions and related research. Sexual risk behavior intervention articles housed by the CDC's Prevention Research Synthesis group were full-text searched as well. The keyword depression was truncated as depress* in order to increase sensitivity in the full-text searches. Reference lists of articles were also searched to identify other relevant published or unpublished studies. Additionally, five journals (*Journal of Acquired Immune Deficiency Syndromes*, *AIDS & Behavior*, *AIDS Care*, *AIDS Education & Prevention* and *American Journal of Public Health*) were searched online (January 2009–November 2010). Finally, a request for reports was also sent to several electronic listservs in order to find other grey literature (Society of Behavioral Medicine; American Public Health Association; American Psychological Association, Division 12; European Association of Social Psychology; European Health Psychology Society), but no additional qualifying studies were obtained.

In order to be included in the sample, a study must satisfy three a priori criteria: (a) report on a face-to-face HIV/AIDS prevention intervention, (b) have a control condition, and (c) report separate analyses for women for depression and sexual risk behavior at baseline and at least one post-intervention assessment. Studies could be from any country or reported in any language, although only English reports were found. Studies were excluded if (a) the intervention included only men, people living with HIV/AIDS, or transgendered individuals, (b) the study was qualitative in nature, or (c) we could not obtain enough statistical information to calculate effect sizes. From the selection criteria and literature search, 10 studies (14 different intervention groups) were included in the analyses.

### *Coding*

Each article, treatment group, and control group were coded. *Article characteristics* included such dimensions as (a) sex of first author, (b) year of data collection, (c) location of study, and (d) whether a theoretical framework guided the intervention design. *Participant characteristics* included (a) age, (b) race/ethnicity, (c) sample type (community, drug users, etc.), and (d) proportion of females in the sample. *Design characteristics* included (a) type of design (e.g., randomized controlled trial), (b) type of control group (e.g., HIV/AIDS education only), and (c) depression measure (e.g., Center for Epidemiological Studies-Depression Scale [CES-D]). *Intervention characteristics* included (a) type of HIV/AIDS education, (b) type of motivational skills, (c) type of behavioral skills, (d) if condom information was provided, (e) if counseling and testing was provided, (f) if condoms were provided, (g) the number and length of sessions (length estimated when necessary), and (h) study quality (measure adapted from Jadad et al., 1996) to evaluate risk of bias. Specific examples of intervention characteristics appear in Table 1. Thirteen reports met the inclusion criteria of the current meta-analysis. One report was excluded because it lacked statistical information necessary to calculate effect sizes (Tripiboon, 2001) and this information could not be obtained from the author; two other reports were excluded because their samples were non-independent from other studies included in the final sample (Nyamathi & Stein, 1997; Sales, Lang, Hardin, DiClemente, & Wingood, 2010). Ten reports with a total of 14 intervention groups and 10 control groups, and a sample size of 4,195 were included in the final sample (Fig. 1). The coding form is available upon request.