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The efficacy of a network intervention to reduce HIV risk behaviors among drug users and risk partners in Chiang Mai, Thailand and Philadelphia, USA☆

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ABSTRACT

This HIV Prevention Trials Network study assessed the efficacy of a network-oriented peer education intervention promoting HIV risk reduction among injection drug users and their drug and sexual network members in Chiang Mai, Thailand and Philadelphia, USA. The study was designed to test impact on HIV infection, but the infection rate was low and the study was terminated early. This paper reports efficacy on outcomes of self-reported HIV risk behaviors. We enrolled 414 networks with 1123 participants. The experimental intervention consisted of six small group peer educator training sessions and two booster sessions delivered to the network index only. All participants in both arms received individual HIV counseling and testing. Follow-up visits occurred every six months for up to 30 months. There were 10 HIV seroconversions, 5 in each arm. The number of participants reporting injection risk behaviors dropped dramatically between baseline and follow-up in both arms at both sites. Index members in the intervention arm engaged in more conversations about HIV risk following the intervention compared to control indexes. There was no evidence of change in sexual risk as a result of the intervention. Reductions in injection risk behaviors were observed: 37%, 20%, and 26% reduction in odds of sharing cottons, rinse water and cookers, respectively, and 24% reduction in using a syringe after someone else. Analysis of the individual sites suggested a pattern of reductions in injection risk behaviors in the Philadelphia site. In both sites, the intervention resulted in index injection drug users engaging in the community role of discussing reduction in HIV injection risk behaviors. The intervention did not result in overall reductions in self-reported sexual risk behaviors, and although reductions in injection risk behaviors were observed, the overall efficacy in reducing risk was not established.

Introduction

Injection drug use is a major mode of transmission of HIV in Asia, North Africa, the Middle East, Eastern and Southern Europe, and areas of North and South America, (UNAIDS, 2006) with many countries reporting injection drug use as the primary mode of HIV transmission (Aceijas, Stimson, Hickman, & Rhodes, 2004). Increasing access to syringes has been associated with risk reduction in many settings (Gibson et al., 2002; National Academies Press, 2006; Semaan et al., 2002). However, injection drug users (IDUs) often report impediments to acquiring syringes and using uncontaminated injection equipment (Rhodes, Singer, Bourgois, Friedman, & Strathdee, 2005). A significant proportion of IDUs continue to share syringes and other types of injection equipment,

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such as cookers (to mix and heat the drugs), cotton (to filter the solution), and rinse water (to clean syringes) (Des Jarlais, Braine, Yi, & Turner, 2007).

Injection drug use is a social behavior and social network analysis has been used to delineate routes of HIV transmission (Friedman et al., 1997; Morris, Zavisca, & Dean, 1995; Rothenberg et al., 1998). Social network characteristics have been found to be associated with HIV serostatus and with injection and sexual risk behaviors (Costenbader, Astone, & Latkin, 2006; Miller & Neaigus, 2001; Neaigus et al., 1996). In addition to being routes of transmission, social networks may be used to diffuse risk reduction information and to promote behavior change (Heaney & Israel, 2002; Latkin, Sherman, & Knowlton, 2003).

In this randomized controlled trial (RCT), active IDUs were trained in culturally appropriate methods of peer education to diffuse drug and sexual HIV risk reduction behaviors among their drug and sexual network members. It was hypothesized that IDUs, trained as peer health educators, would facilitate behavior change within their networks through bounded normative influence (Kincaid, 2004). The social role of peer educator was designed to garner social rewards from support and risk networks members, and hence increase the likelihood of the peer educators sustaining their HIV prevention outreach activities (Latkin & Knowlton, 2005). It was also anticipated that inhabiting the role of peer educator and advocating risk reduction would lead to personal risk reduction.

Prior HIV prevention intervention has successfully utilized peer education (Brieger, Delano, Lane, Oladepo, & Oyediran, 2001; Siegel, Aten, & Ehaharo, 2001). The intervention was based on theories of social influence (Lewis, DeVellis, & Sleath, 2002), diffusion of innovations (Rogers, 2003), social learning (Bandura, 1977), social identity (Turner, 1978) and social norms (Van Knippenberg, 2000). Thus, this intervention was based, in part, on the premise that peer educators, who were trained to act as role models in their networks, would increase the salience of risk reduction norms and diffuse proscriptive and descriptive risk reduction norms and behaviors. Voluntary HIV counseling and testing (VCT) was provided to all study participants. The goal of the study was to determine if a network-based intervention lead to significantly greater reduction in risk behaviors and infections as compared to high quality VCT among IDUs and their risk network members.

Methods

Recruitment

The study sites were Philadelphia, USA and Chiang Mai, Thailand. These sites were chosen based on their prior demonstration of recruiting and retaining cohorts of IDUs. IDUs in Philadelphia were recruited by outreach workers from neighborhoods with high concentrations of drug use, drug sales, and AIDS cases. Philadelphia has a population of approximately 1.5 million. The number of injectors has been estimated to be 50,000 (Brady et al., 2008; Friedman et al., 2004). Among injectors, heroin is the primary drug of choice, though many IDUs also inject speedball and cocaine. Injection drug use has accounted for approximately 33% of all HIV and AIDS cases diagnosed since 1980 (Philadelphia Department of Public Health, 2008). Overall prevalence of HIV infection among IDUs has been estimated at 15% (Metraux, Metzger, & Culhane, 2004). Philadelphia site participants, as in most urban areas in the US, can be presumed to have been exposed to numerous HIV prevention messages targeting IDUs. One study in Philadelphia found that 80% of respondents reported that new syringes were "very" easy to obtain and 77% reported using a new syringe at their last injection (MacGowan et al., 1998).

In Thailand, participants were recruited from the city of Chiang Mai and surrounding villages. The recruiters arranged community meetings to explain the project. They also provided educational and recreational activities to build a relationship with the community. Throughout the recruitment process, the recruiters held focus groups with IDUs to evaluate recruitment approaches. Many IDUs in northern Thailand were exposed to HIV prevention campaigns and community activities about HIV during the epidemic in the late 1980s, and it is likely that many had friends die from HIV/AIDS. VCT has been available at hospitals throughout northern Thailand since 1992. The HIV prevalence rate among IDUs in Northern Thailand was reported in 2006 to be 28%, with only 36% reporting prior VCT and 59% reporting no pre and/or post-test counseling (Kawichai et al., 2006).

Recruitment in Thailand was delayed for a year due to the governmental policy known as the "war on drugs", which commenced in February 2003 and persisted through the duration of the study. This draconian policy resulted in the extrajudicial murder of over 2500 drug users and the incarceration of hundreds of thousands of others. Many others hid or moved. This policy had a profound effect on patterns of drug use and social dynamics among drug users (Poshyachinda et al., 2005; Suwannawong, 2004; Vongchak et al., 2005) leading to lower reported frequency of injection drug use among potential participants and greater difficulties recruiting participants. As a result, we expanded recruitment to rural sites. Participants were enrolled and followed between December 2002 and July 2006 in Philadelphia and March 2004 and November 2006 in Thailand.

Eligibility criteria

Eligibility criteria for index participants, who were the initial participants recruited and asked to identify and recruit their drug and sex network members, included: legal age to provide written informed consent, injected drugs at least 12 times in the prior three months, not in methadone maintenance in previous 3 months, HIV negative antibody test results within 60 days of randomization, and willingness to identify and attempt to recruit at least two HIV risk network members who were eligible for the study. After completing the baseline visit and returning for HIV test results, index participants were required to recruit at least one risk network member into the study. Although index participants were required to list at least two eligible network members on the network inventory, they were asked to bring in only one of these network members in order to be randomized into one of the 2 study arms.

Eligibility requirements for the network members included: legal age to provide written informed consent, recruited by an eligible index participant, and injected drugs or had sex with the relevant index participant within the prior three months. Once the index member had recruited at least one eligible network member, the network (the index and at least one network member) was eligible for randomization. When sufficient eligible index members had accumulated for an intervention group at a site (at least 12), ensuring a peer training group of at least 6, randomization was scheduled. Sealed envelopes containing pre-computed blocks with 1:1 randomization to control and treatment arms for groups (blocks) of size 12, 14, 16 18 and 20 were produced by an independent statistical center and used in sequence for each group randomization. On the day of randomization, the next block randomization envelope from the sequence matching the group size was taken (groups of odd size were rounded up and the last assignment discarded). Randomization arm was assigned to index participants (and their network members) by matching ordered study ID numbers (assigned at time of screening) to the list of pre-computed assignments. The assignments were reported to the statistical center, where they were checked for consistency against the original lists.