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Kathleen Norr [a], Sheila Tlou [b] & Matshidiso Moeti [c]
[a] University of Illinois at Chicago, Chicago, Illinois, USA
[b] University of Botswana, Botswana, Africa
[c] WHO Regional Office for Africa, Zimbabwe, Harare

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IMPACT OF PEER GROUP EDUCATION ON HIV PREVENTION AMONG WOMEN IN BOTSWANA

Kathleen F. Norr, PhD, James L. Norr, PhD, and Beverly J. McElmurry, EdD, FAAN
University of Illinois at Chicago, Chicago, Illinois, USA

Sheila Tlou, RN, PhD
University of Botswana, Botswana, Africa

Matshidiso R. Moeti, MB, BS, MSc
WHO Regional Office for Africa, Zimbabwe, Harare

A peer group HIV prevention intervention based on social–cognitive learning theory, gender inequality, and the primary health care model for community-based health promotion was developed for more than 300 urban employed women in Botswana. All women volunteered to participate in the intervention. To control for self-selection, matched workplaces were assigned to the intervention group or to the delayed control group. Compared with women in the delayed control group, women in the intervention group had significantly higher postintervention levels of knowledge of HIV transmission, sexually transmitted diseases (STDs), and HIV prevention behaviors; positive condom attitudes and confidence in condom use; personal safer sex behaviors; and positive attitudes toward persons living with HIV/AIDS

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Address correspondence to Kathleen F. Norr, College of Nursing (m/c 802), University of Illinois at Chicago, 845 South Damen Ave., Chicago, IL 60612-7350, USA. E-mail: knorr@uic.edu

and community HIV/AIDS-related activities. The peer group leaders have sustained the program for more than 5 years after the end of research funding. Peer groups are a low-cost and sustainable intervention that can change HIV prevention knowledge, attitudes, and behaviors for ordinary urban employed women in sub-Saharan Africa.

The AIDS pandemic is an international health priority. The region most adversely affected is Sub-Saharan Africa, which has about four of every five cases of HIV/AIDS worldwide. Heterosexual transmission is the main route of HIV transmission in sub-Saharan Africa (United States Agency for International Development (UNAIDS)/World Health Organization (WHO), 2001). Changing sexual behaviors to reduce the risk of HIV transmission is a major public health challenge. Unlike many other health promotion behaviors, sexual behaviors are not fully under an individual's control, as they require partner cooperation. For women, gender inequality often poses a barrier to changing their own or their partner's sexual behavior. Therefore, an HIV prevention intervention for women must address both general and gender-inequality barriers to behavioral change.

Our purpose is to describe the impact of a peer group intervention for HIV prevention on safer-sex behaviors and community HIV-related activities for working women in Botswana. We also discuss the ways participants have sustained the program for more than 5 years after the research. While previous research has examined the efficacy of peer groups for specific high-risk groups in Africa, to the best of our knowledge this is the first study to describe the effects of a peer group intervention for ordinary urban working women in sub-Saharan Africa.

BACKGROUND

Women and HIV in Botswana

By the end of 2001, there were an estimated 330,000 persons who were HIV positive in Botswana, with an estimated prevalence rate of 38.8% for adults aged 15–49 (UNAIDS/WHO, 2002). Women contract HIV infection at younger ages than men, so prevention for young women is a high priority. In Botswana, like in much of sub-Saharan Africa, migration due to economic pressure is widespread, and the consequent family separation results in risky behaviors for both men and women (Campbell & Williams, 1999; Chirwa, 1997). In Botswana's urban areas, many women are either on their own or temporarily separated from a partner. Loneliness and economic pressures often increase their risky sexual behaviors.

Botswana's well-developed transportation network, seasonal movement from village fields to cattle posts, and close ties between urban dwellers and their villages and cattle posts all contribute to the rapid spread of the infection (Fidzani, Ntseane, & Seloilwe, 2001).

A Conceptual Model for HIV Prevention for Women

Our intervention integrates the peer group approach, sensitivity to gender inequality issues, and the primary health care model for community-based health promotion. The intervention content and learning strategies use a peer group approach based on the social–cognitive learning model (Bandura, 1989). Peer leader and peer group interventions have been among the most successful interventions in changing risky sexual behaviors in both developed and developing countries, including several recent peer-based community interventions with minority women in the United States (Dancy, Marcantonio, & Norr, 2000; Kalichman, Carey, & Johnson, 1996; Lauby, Smith, Stark, Person, & Adams, 2000; MacKenzie et al., 1999; Mallory & Fife, 1999; National Institutes of Health, 1997; Sikkema et al., 2000; Wingood & DiClemente, 1996). In Africa, peer-based interventions have been effective for transportation workers, commercial sex workers, and young people in schools (Kebaatswe & Norr, 2002). However, we have found no published reports of peer group interventions with women who are not sex workers in sub-Saharan Africa.

Peer groups foster behavioral change in many ways, including providing social support, detailed information, local development of new norms and values that support HIV prevention, specific safer sex skills, and increased self-efficacy through rehearsal and role modeling. For maximum effectiveness, peer group interventions must be closely tied to the specific cultural and social environment of the target group (Erhardt, 1997; Kalichman et al., 1996). In the preliminary phase of this study, we conducted in-depth interviews with 56 urban women in Gaborone, Botswana, regarding their HIV prevention needs. These data helped us to tailor the peer group intervention to the cultural context, values, and resources of Botswana (Norr, Tlou, & McElmurry, 1996).

Gender barriers pose major issues for HIV prevention in all societies (Amaro & Raj, 2000; Gupta & Weiss, 1993; Norr, Tlou, & Norr, 1993), and a failure to address gender inequality may account for the more mixed results of interventions for women than for men (Erhardt, 1997; Mallory & Fife, 1999; Wingood & DiClemente, 1996). Gender-related customs prevalent in many parts of Africa that are barriers to HIV prevention include cultural acceptance of male dominance and of male physical and sexual violence, polygamy and informal mistresses, and extended postpartum abstinence that often leads men to take new partners (Fidzani et al., 2001; Lugalla et al., 1999). Open communication around sexual-

ity also is socially discouraged in most African countries, except within traditional initiation ceremonies (Fuglesang, 1997; Kamlongera, 1997; Kesby, 2000; Miles, 1993; Olayinka, Alexander, Mbizvo, & Gibney, 2000; Susser & Stein, 2000; Veruyl, 1996). In Botswana, these factors have been moderated somewhat by relatively high education and economic activity among women, especially in urban areas, and greater equality of female-to-male educational levels and occupational opportunities than in most African countries.

Our peer group intervention incorporated discussion of gender inequality. When developing an intervention for women, a major issue is whether to include men. The presence of men may limit women's ability to speak freely, but men and women need to communicate around HIV prevention issues. Previous research does not provide consistent results. A review of voluntary counseling and HIV testing in African countries found counseling for couples was more effective than for individuals (Dayton & Merson, 2001), and a single study with African American adolescents found that mixed- and single-gender groups were equally effective (Jemmott, Jemmott, Fong, & McCaffree, 1999). However, Erhardt (1997) concluded that the most efficacious peer group interventions for women were targeted to women specifically and focused on relationship issues and negotiation skill. In an African setting, mixed-gender groups may expose women to partner violence. Therefore, we chose to develop this peer group intervention for women only.

The service delivery model for our intervention comes from the WHO primary health care model. It incorporates (a) equitable access to health services, (b) maximization of community involvement, (c) focus on prevention and health promotion, (d) use of socially acceptable and sustainable technology and resources, and (e) a multisectoral approach to health and development (McElmurry & Keeney, 1998, 1999). Previous researchers have demonstrated that a primary health care team consisting of nurse-leaders, trained community members, and university support staff can effectively offer interventions addressing a variety of community health problems including violence, maternal–infant health, and school-based health promotion (Boyd, Norr, & Nacion, 2001; McElmurry, Norr, & Parker, 1999). This intervention's implementation team included the nurse-coordinator, the trained peer group leaders, and the university support and evaluation team.

RESEARCH QUESTION AND HYPOTHESES

We examine whether a peer group intervention for HIV prevention improves HIV prevention attitudes, knowledge, and behaviors for urban working women. We did not expect that the intervention would affect

concern about HIV/AIDS in general or perceived personal risk, because the epidemic was fairly advanced and very salient for people in Botswana. We hypothesized that, compared with the delayed control group, women who received the peer group intervention would have the following:

1. increased knowledge about sexually transmitted infections (STIs), HIV transmission, and prevention behaviors;
2. more positive attitudes toward condoms and greater condom use self-efficacy;
3. more personal safer sex behaviors (abstinence or consistent condom use); and
4. more community HIV prevention activities and more positive attitudes toward persons living with HIV/AIDS.

METHOD

Our evaluation used a quasiexperimental pre- and post-test design with intervention and control groups. We tested the intervention in urban workplaces with large numbers of young female workers. To obtain a control group with the same level of motivation to attend the intervention without denying the intervention to those who wanted it, the delayed control group workplaces received the intervention at the end of the evaluation.

The Intervention

The intervention occurred over six 90-minute weekly or biweekly sessions. Sessions focused on increasing awareness of the AIDS epidemic; knowledge about sexuality and STIs; information about HIV, AIDS, and HIV prevention; hands-on condom skills; communication and partner negotiation skills; and HIV prevention in the community. Each session included role plays to build communication skills related to that session's content. The peer education manual and leader training program are available upon request. The sessions were well attended: 59% missed no sessions, and another 20% missed one or two sessions only.

These peer group sessions occurred in workplaces because this was an easy way to access large numbers of sexually active women. However, this program differs from most workplace interventions described in the literature. The program was not sponsored or sustained by the workplaces, and it was offered only to women, not to all employees. The groups met during their lunch hour or after work, not during work time. The project has since offered this intervention in a wide variety of settings.

Procedure

After obtaining agreement from the managers or directors, we met with women workers and introduced the program. Women who wanted to participate signed up and formed groups of around 10–15 workers. Each group then selected 2 peer leaders. From 2 to 6 leaders were identified at each site depending on the number of participants. Later, the project evaluation team obtained individual informed consent and conducted an individual pretest interview with each volunteer. No signed consent was obtained so that participants could remain anonymous.

The program nurse and staff conducted a 3-day workshop to train the selected leaders in the intervention group. The peer leaders first went through the program as participants and then practiced peer group facilitation skills. After training, the intervention group leaders conducted the peer group sessions with their coworkers. A nurse-coordinator provided ongoing support and encouragement for the leaders. Upon completion, the leaders and participants received certificates.

Between 8 to 10 weeks after all the intervention worksites had completed the sessions, the project staff returned to both intervention and delayed control group workplaces and conducted the post-test interviews. Then the delayed control group peer leaders received training and facilitated the peer group sessions. The delayed control group participants had a final interview after they had completed the intervention.

Site and Sample

We identified potential workplace sites in consultation with the then director of the AIDS/STD Unit of the Ministry of Health. The intervention was introduced at 12 different workplaces, including banks, government offices, and university and college maintenance departments. Sites were grouped by type of workplace and size. The first workplaces that agreed to participate became intervention sites. Workplaces that agreed to participate later became delayed control group sites. Only two of the workplaces failed to complete the intervention, and these were dropped from the analysis because there were no post-test interviews. The number of sites assigned to the intervention group was greater than the control sites because of several instances where we had two similar sites that agreed early and only one comparable control site. It is possible that workplaces that agreed to participate first were more interested in the intervention, perhaps because they had more workers with AIDS or had a more concerned management. However, the major factor affecting timing was how quickly we were able to set up appointments at different workplaces. Two bank sites declined to participate because they feared

the intervention would disrupt their work schedule. All the other workplaces agreed to participate as soon as they were asked, regardless of whether they were to be in the intervention or delayed control group. Thus, workplace selection bias is not likely to have differed between the intervention and delayed control groups. And when we included in our analyses of outcomes a four-category measure combining workplaces into banks, government offices, cleaners, and libraries, we found no statistically significant effects for workplace type (data not presented).

There were 261 women in the intervention group and 142 in the delayed control group at the initial pretest interview. At the post-test interview, there were 207 intervention group participants and 71 delayed control group participants. After the post-test for both groups, the delayed control group received the intervention, followed by a second post-test interview with 85 participants. The overall retention rate from the pre- to the post-test was 69%. There was more attrition from the workplace due to transfers and educational or maternity leave than we had anticipated. The rates at the post-test (about 4 months after the intervention) were substantially lower for the delayed control group (50%) than for the intervention group (79%). Some delayed control group sites had already started their peer group sessions when the evaluation team came to do post-test interviews, so women at these sites (11% of the total) could not complete a valid control group post-test. The response rate at the second post-test for the delayed control group (about 8 months after the initial pretest) went back up to 60% of the original 142 women. We compared the pretest demographics and HIV attitudes, knowledge, and behaviors for women who had both interviews with women who had only the pretest interview, and we found no significant differences for either the intervention group or for delayed control group (data not shown). The similarity of those remaining in the study and those lost to follow-up increases confidence that our results are not likely to be due to differential dropout, although that possibility cannot be ruled out.

Concepts and Operational Measures

We used social–cognitive learning theory to examine concern, HIV prevention-related knowledge, condom attitudes and self-efficacy, individual safer sex practices, and community HIV prevention factors. Specific items and scales to measure each concept were developed in the first phase of this study based primarily on the qualitative individual interviews described earlier (Norr et al., 1996).

We examined two aspects of concern: the community concern of the AIDS epidemic as a social issue and a single item rating of perceived personal risk of HIV. Knowledge included three different domains: HIV

transmission routes, HIV prevention behaviors, and other STIs. Eight of the HIV transmission items and the HIV prevention behavior item were taken from the second Botswana Family and Health Survey (Lesetedi, Mompati, Khulumani, Lesetedi, & Rutenberg, 1989). Cronbach's α reliability coefficients ranged from .63 to .68, slightly lower than the recommended 0.70. Seventeen items regarding knowledge about HIV transmission included in the original questionnaire, coded as correct or incorrect, were reduced to an 8-item scale based on factor analysis, item intercorrelations, and reliability ($\alpha = .64$). Factor analysis clearly identified two 4-item separate components of the 8-item overall knowledge scale: correct knowledge, or awareness of ways in which HIV is spread ($\alpha = .64$), and HIV myths about false possible ways HIV is transmitted ($\alpha = .68$). HIV prevention behaviors were measured by asking how a person could keep from getting HIV infection and recording all responses. These were then dichotomized according to whether the respondent mentioned both condom use and abstinence or monogamy. Knowledge about STIs was a sum of 11 items scored as correct or incorrect about signs and symptoms, treatment, and relationship to HIV infection ($\alpha = .63$).

Condoms are a major method of reducing the risk of HIV transmission. At the time of this study, female condoms were not available in Botswana. The qualitative interviews in the preliminary phase of our research found that more than two-thirds of the women who had used condoms had been the ones to suggest using condoms to their partners, and that women need to feel confident about using condoms correctly to encourage their partners and to cooperate in appropriate condom use. Thus, the intervention focused on increasing women's belief in condom effectiveness, positive attitudes, and self-efficacy about using condoms correctly. Belief in condom effectiveness was assessed using 3 items about prevention of pregnancy, HIV infection, and STIs. Condom attitudes were measured using items that tapped several themes about condom use that emerged in the preliminary interviews. Eight initial items were reduced to four based on factor analyses and scale psychometrics to form a scale ($\alpha = .71$). Condom use self-efficacy was measured with a single item that asked about their confidence in their ability to use male condoms correctly. Women also need confidence about discussion of condom use with partners, but unfortunately, no items measured the women's self-efficacy to persuade a partner to use a condom or to insist on condom use.

We examined safer sex practices using a dichotomous measure where safer sex was defined as abstaining or using condoms always with all reported sexual partners in the last 2 months. The two dimensions of community prevention we examined were more positive attitudes toward persons living with HIV/AIDS and greater involvement in community

AIDS-related activities. Attitude toward persons living with HIV/AIDS was assessed using a scale that combined 4 items used in the Family and Health Survey (Lesetedi et al., 1989) and 2 items identified in the interviews ($\alpha = .62$). To assess community activities related to HIV prevention, we created an index that summed each individual's participation in 11 different reported activities and HIV-related discussions.

Analysis

We had planned to base our analyses on individually matched pre- and post-tests, but we had unanticipated difficulties in matching the anonymous interviews using just respondents' demographic and workplace information. We only successfully matched pre- and post-tests for 130 women: 98 in the intervention and 32 in the delayed control. So in the results that follow, we report pretest and post-test *unmatched* data for all respondents. To evaluate the effects of the peer groups, we first compared the intervention and delayed control groups on outcome measures at pretest to determine if there were any preexisting differences. We then compared the intervention and delayed control groups on the outcome measures at post-test. In results not presented here, we also analyzed the effects of the intervention compared with the delayed control group on outcome measures using the smaller sample matched data. For all outcome measures where we report below a statistically significant difference between the means of the intervention and delayed control groups for all (unmatched) respondents, there was also a significant difference for the smaller sample of matched respondents, both with and without inclusion of pretest values of the outcome measure as a covariate in the prediction of post-test outcome measure.

RESULTS

The intervention and delayed control group were very similar in their demographic characteristics. The only statistically significant difference was that the intervention group had a lower proportion of women under 30 years old (58% vs. 70%; chi-square = 5.50, df = 1, $p < .05$). More than three quarters of the participants had at least some education beyond primary school. Only 18% did not have any children. The two groups were very similar in terms of their current type of partner and the number of partners they reported. Fewer than 10% reported having no current sexual partner. About a fifth were married, and nearly a quarter lived with a partner to whom they were not married. Over half had a steady or occasional partner who did not live with them. Most women had only one partner currently (within the last 3 months), but nearly all

reported that they had had more than one partner at some point in their life. Nearly a third had two or more partners in the last year. Over a quarter of the women said that they had had at least six partners in their lifetime.

In Table 1 we present both the pretest and post-test levels of outcomes for the intervention and delayed control groups. Because women were already highly concerned about the AIDS epidemic, we did not expect that either community concern or perceived personal risk would increase after the intervention. The intervention and control groups did not differ in either their pretest or post-test levels of community concern or personal concern.

As we had hypothesized, there were significant post-test differences in knowledge about HIV transmission, STIs, and prevention behaviors for the intervention group compared with the delayed control group. None of the indicators of knowledge differed significantly between the intervention and control groups at the pretest. Initial HIV transmission knowledge levels were fairly high, with a mean of just over 5 out of 8 items correct. At the post-test, the intervention group had significantly higher overall HIV transmission knowledge than the delayed control group (mean 6.6 vs. 6.2, $t = 2.13$, df $= 276$, $p < .05$). Comparison of the two subscales shows that nearly all of the difference in knowledge is in the belief in myths about transmission. At post-test, the intervention group had a mean of 2.8 correct of the 4-item myths index (70% correct) compared with only 2.4 (60% correct) for the delayed control group ($t = 2.34$, df $= 276$, $p < .05$). This is likely to be an important difference, especially given qualitative evidence that belief in myths is a strong barrier to willingness to practice safer sex (Norr et al., 1996). Knowledge of correct transmission was much higher (mean of over 3 on a 4-point scale at pretest and 3.7 at post-test), and the intervention and delayed control groups did not differ at post-test. STI knowledge was also significantly greater at the post-test, with the intervention group scoring a mean of 7.5 items correct out of 11 (68% correct), compared with 6.7 for the delayed control group (61% correct). This effect was statistically significant ($t = 3.36$, df $= 220$, $p < .001$), but the difference is probably not large enough to have an important impact on HIV prevention. It is important to note that there was a clear need for greater education about STIs and their relationship to HIV transmission in both groups. Knowledge about what behavior changes can reduce the risk of HIV transmission was significantly greater at post-test for the intervention group than the control group ($t = 4.52$, df $= 89$, $p < .001$). Nearly 90% of the intervention group named both condom use and partner reduction/abstinence at post-test, compared with only 62% of the delayed control group, a substantial difference likely to relate to greater readiness for HIV prevention.

Table 1. Attitude, knowledge and behavior changes for intervention and delayed control groups

	Pretest		Posttest	
	Intervention ($N = 261$)	**Delayed control ($N = 142$)**	**Intervention ($N = 207$)**	**Delayed control ($N = 71$)**
Concern				
Community Seriousness Index	1.61	1.49	1.67	1.54
Perceived Personal Risk (% saying 'strong risk')	26%	24%	17%	15%
Knowledge				
HIV/AIDS Transmission Scale (0–8)	5.18	5.28	6.57	6.19*
Correct HIV Transmission (0–4)	3.49	3.38	3.76	3.77
HIV Myths Scale (1–4)	1.69	1.89	2.81	2.42*
STI Knowledge Index (0–11)	6.03	5.96	7.49	6.73***
Prevention Behaviors: Mentions Condoms and 1 Partner (%)	66%	69%	90%	62%***
Condoms Attitudes				
Positive Attitudes toward Condoms Scale (0–4)	2.43	2.24	3.35	2.48***
Believe Condoms Effective (0–3)	2.92	2.91	2.89	2.90
Very Confident Can Use Correctly (%)	34%	32%	76%	44%**
Safer Sex Behaviors				
Practicing Safer Sex (use condoms always or abstains) (%)	27%	23%	47%	34%*
Uses Condoms Always (%)	*20%*	*18%*	*42%*	*34%**
Abstains (%)	*7%*	*6%*	*5%*	*0*
Community Attitudes and Behaviors				
Positive Attitude toward Persons living with HIV/AIDS Scale (0–6)	4.12	3.58***	5.00	4.10***
Community Prevention Behaviors Index (0–11)	4.99	4.97	6.13	4.68***

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

As hypothesized, the intervention was associated with significantly higher positive condom attitudes and condom self-efficacy, but not with women's belief in condom effectiveness. The intervention and delayed control groups did not differ significantly at pretest for any of these measures. At the pretest, nearly all women believed condoms were highly effective, with a mean score of 2.9 on a scale with a maximum of 3. These already very high scores did not change for either group at the post-test. The intervention group had significantly more positive attitudes toward condoms at the post-test, with a mean nearly 1 point higher on a 0–4 point scale than the delayed control group (3.35 vs. 2.48, $t = 5.16$, df $= 101.4$, $p < .001$). There also was a very substantial post-test difference in the proportion of women who said that they felt very confident that they could use a condom correctly. Before the intervention, about a third of both groups answered affirmatively. After the intervention, 76% of women in the intervention group felt very confident about using condoms correctly, compared with only 44% in the delayed control group ($t = 4.85$, df $=$ 107.6, $p < .001$). Thus, the intervention was associated with significant and large effects on both condom attitudes and condom use self-efficacy.

The intervention was also associated with an increase in safer sex behaviors (abstaining or using condoms always). Before the intervention only about a quarter of the women reported that they were having safer sex, and the intervention and delayed control groups did not differ significantly. Nearly half of the intervention group reported practicing safer sex consistently at the post-test, compared with only 34% of the delayed control group ($t = 2.04$, df $= 126.8$, $p < .05$), a difference large enough to have an important effect on HIV prevention. It should be noted that the number of women who reported that they practiced safer sex increased in both groups, suggesting a concurrent trend of overall increase in safer sex practices. Nearly all of this increase was due to reported increased use of condoms. Fewer than 10% reported abstinence at any time.

The intervention had the predicted positive impacts on women's community-related HIV and AIDS attitudes and behaviors. The intervention increased community HIV-related activities for the intervention group. The two groups did not differ in their level of community activities at intake, but at post-test the intervention group had a mean of 6.1 activities compared with 4.7 activities for the delayed control group ($t = 4.64$, df $= 90.24$, $p < .001$). The intervention group had more positive attitudes toward persons living with HIV and AIDS at both the pretest and the post-test. At pretest, the intervention group had a mean of 4.1 positive responses out of 6 items, compared with 3.5 for the delayed intervention group. This is the only outcome measure that showed pretest differences between intervention and delayed control groups. At post-test, the intervention group had a mean of 5.0 out of 6 items answered

positively (or 83% positive), compared with 4.1 (or 68% positive) in the delayed control group ($t = 4.33$, df $= 90.41$, $p < .001$). As discussed earlier, we found that the post-test difference remained significant controlling for pretest levels analyzed using the smaller matched samples. The post-test difference is large enough to have practical importance for prevention: Stigma is an important aspect of prevention that needs direct attention.

Sustaining the Intervention

Perhaps the most important achievement of this project is the degree to which the Botswana coinvestigator and the peer leaders have succeeded in sustaining the community HIV prevention activities of the project over time. While still conducting the evaluation under U.S. funding, the project continued to train new peer leaders, especially primary school teachers. Nearly all primary schools in the capital city had at least two teachers trained as peer leaders, who then offered the peer group sessions to interested coworkers after school. The project also trained a team of peer group leaders in each of five rural districts of Botswana. Despite some difficulties in four of the districts, peer group sessions eventually were held and the groups were very popular with participants.

After research funding ended, many peer group leaders continued to offer the intervention or parts of it to their coworkers. Leaders and group members also invited neighbors to their homes for informal discussions of AIDS prevention. One issue that women brought up repeatedly in the intervention was the need to dialogue with men. Several of the group leaders began men-only or mixed-sex groups at their workplaces. Some groups developed original songs and dramas in Setswana, which have been performed on Radio Botswana and at annual World AIDS Day commemorations. Several group members joined their local health clinic advisory group, where they are participating in AIDS-related activities. In 1995, several of the peer group leaders formed the Botswana chapter of the Society for Women and AIDS in Africa (SWAABO), linked to the SWAA international organization. SWAABO is the only organization that represents the issue of HIV and gender inequality in the Botswana Women's Non-Governmental Organizations Coalition, and it has represented the coalition in matters of gender and health at national and international forums, including the United Nations 1995 Beijing Conference and annual meetings of the United Nations Commission on the Status of Women in New York. After research funding ceased, the Peer Education Project received grants from the Ministry of Home Affairs and the European Community, which allowed the project to reach the 18–19-year-old men and women enrolled in the National Service Programme.

Since 1998, the project has been funded continuously by the Women's Affairs Department. SWAABO's male counterpart, the Society for Men and AIDS in Botswana (SMAABO), was formed in 1998 and has a strong youth membership.

DISCUSSION

This research demonstrates that a peer-led AIDS prevention intervention that incorporates social–cognitive learning to enhance self-efficacy is effective in changing HIV-prevention-related attitudes, knowledge, and behaviors for urban working women in Botswana. Peer group interventions have been successful for commercial sex workers and other high-risk groups in Africa as well as other countries (Kebaatswe & Norr, 2002). This study shows that peer groups also can change behaviors for ordinary African women who are not sex workers. Because these peer groups were organized in workplaces, we cannot generalize results to other settings. Workplaces facilitate the formation of peer groups and regular meetings because all the women are in the same place a large part of the day. Women who are employed have greater financial and perhaps emotional independence, which may make it easier for them to practice safer sex. The project has been introduced successfully in other settings, but we lack comparable data regarding effectiveness of the peer group in other settings.

The success of the intervention supports the conceptual model based on social–cognitive learning, gender inequality, and primary health care for interventions. The peer groups were successful in changing intermediate factors specifically targeted by the social–cognitive learning model, including specific prevention knowledge, positive attitudes toward condoms, and confidence in use of condoms, factors that did not change in the delayed control group. The peer group may be an especially effective way to promote change related to gender inequality. Talking about gender issues and practicing partner negotiation behaviors in a peer group of supportive women can help women develop the confidence to change.

The intervention occurred in the context of a strong national mass media campaign regarding HIV prevention and AIDS as well as in a variety of less readily identifiable contextual changes such as increasing AIDS deaths. Although the intervention group increased significantly more, the delayed control group also showed some increases in most knowledge variables and safer sex behaviors. These findings suggest that both the intervention and the social context, including mass media campaigns, had an impact on behaviors and that this impact was additive. Peer group interventions can speed up the rate of HIV prevention change.

The primary health care model of integrating health worker expertise and peer group members' contextual knowledge facilitates dissemination and sustainability. Peer group leaders identified by each group help tailor the intervention to the specific context because they are intimately acquainted with the local context for HIV prevention. The leadership capacity that peer leaders develop can enhance social and economic development in areas beyond HIV prevention.

Even with the most optimistic projections regarding international cooperation and lower cost drugs and new vaccines, primary prevention remains the key to controlling the spread of HIV infection in hard-hit developing countries of sub-Saharan Africa. Preventing heterosexual transmission involves perhaps the most difficult behavioral changes ever attempted on a wide scale. This research shows that peer group intervention can be an important component of HIV prevention for community women in the developing countries, especially in sub-Saharan Africa. Its participatory nature and low cost make it feasible and affordable to disseminate on a large scale.

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