

# A Controlled Study of an HIV/AIDS/STI/TB Intervention with Traditional Healers in KwaZulu-Natal, South Africa

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**Abstract** Traditional healers play an important role in southern Africa culture and health care including the HIV epidemic. Here we report among the first controlled studies of an HIV/AIDS, sexually transmitted infections (STI) and tuberculosis (TB) intervention for traditional healers in South Africa. At baseline 233 traditional healers were assessed in four selected communities in the KwaZulu-Natal province and received either an experimental intervention or a no intervention control condition. The intervention group received training in HIV/AIDS, STI, and TB prevention over 3.5 days as well as a supervisory follow-up visit. At 7–9 months follow-up intervention effects were significant for HIV knowledge and HIV and STI management strategies including conducting risk behavior assessments and counseling, condom distribution, community HIV/AIDS and STI education, and record keeping. The study found a high level of preparedness among traditional healers to work with and refer patients to biomedical health practitioners, yet no higher levels of referral to biomedical practitioners were found after the training.

**Keywords** HIV/AIDS/STI · controlled evaluation · intervention · traditional healers · South Africa

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## Introduction

Traditional healers who practice in South African can broadly be grouped into three types; the traditional doctor or *inyanga* who is typically male and uses herbal and other medicinal preparations for treating disease (or herbalist); the *isangoma* (Zulu) or diviner, usually a woman who operates within a traditional religious supernatural context and acts as a medium with the ancestral shades; and the faith healer who integrates Christian ritual and traditional practices (Freeman & Motsei, 1992). Many South African patients consult traditional healers as a first effort to remedy ailments (Louw & Pretorius, 1995). For example, Peltzer (2000) found that among 104 black Africans sampled from the general public in Limpopo Province South Africa that 68% sought medical treatment for their last illness, followed by the herbalist (19%) for minor and chronic conditions, the diviner (9%), and faith healer (4%). Traditional healers seem to be consulted often for the treatment of sexually transmitted infections (STIs) such as *Tshofela/drop* (gonorrhoea), *Thosola* (syphilis), and assumed HIV/AIDS (Peltzer, 1998, 2001). In a community survey, Peltzer (2003) found among rural adult South Africans that, of those who reported to have had a STI in the past 12 months, 36% had consulted traditional healers for treatment. Wilkinson and Wilkinson (1998) found that, among 360 patients presenting with STIs in a primary care clinic in KwaZulu-Natal, 14% had sought care for their previous illness from a traditional healer. Persons may consult traditional healers for the treatment of STIs because they provide client-centered and personalized health care that is tailored to meet the needs and expectations of their patients, paying special respect to social and spiritual matters (King & Homsy, 1997).

The South African HIV prevalence amongst adults (15–49 years) is estimated to be 16% nationally and 21% in

KwaZulu-Natal province (Shisana et al., 2005). In areas of high HIV prevalence traditional healers often play a role in STI and HIV prevention, care and treatment. Nevertheless, a number of researchers have identified significant HIV risk practices among traditional healers. For example, Chipfakacha (1997) conducted a study in Botswana and found that some healers used their mouth for sucking blood from patient as a form of blood-letting. Somsé et al. (1998) found that three out of four healers in the Central African Republic reported using enemas as a treatment method had reused enema equipment without sterilization. Peters, Immananagha, Essien, and Ekott (2004) reported that among Nigerian patients who had visited traditional healers, 77% had incisions made with un-sterilized blades. Herbal preparations were rubbed into actively bleeding skin cuts with the protection of gloves. Making incisions (*umgcabo*) and punctures (*ukutshobha*) in the skin for the purpose of introducing traditional medicine (*umuthi*, pl. *imithi*) into the human body is a widely used technique in traditional Zulu medicine. Due to the role of traditional healers in the care and treatment of STIs, including HIV/AIDS, it has become apparent that healers should be involved in referral and treatment, as well as in the promotion of behavior change (Green, 2000; Munk, 1998–Peltzer, 2000, 2003; Wilkinson & Wilkinson, 1998). Collaborative HIV/AIDS, STI, and tuberculosis (TB) programs involving traditional healers have been initiated in a number of sub-Saharan African countries (Chirwa & Sivile, 1989; Colvin, Gumede, Grimwade, Maher, & Wilkinson, 2002; Green, Zokwe, & Dupree, 1995; Key & DeNoon, 1995; King & Homsy, 1997; Somsé et al., 1998). Traditional healers are well known in their communities for treating STI and are becoming more involved in treating HIV/AIDS (Green, 1994). However, there is a scarcity of empirical research showing the effect of integrating traditional healers in mitigating the spread of HIV/AIDS in South Africa.

King and Homsy (1997) found that experiences across African countries show that modern and traditional care systems are not incompatible. Collaborations among traditional and modern providers can create complementary systems that are of greater benefit to patients and communities. Preliminary assessments of some projects have shown that, although in most cases ‘trained’ healers quickly assimilate the new knowledge and integrate it into their practices and messages they deliver to communities, misconceptions remain, especially after short-term training. Training programs have emphasized HIV-related issues including HIV transmission risks, infection control procedures, and condom use. Referral is normally expected from the traditional healer to the biomedical health practitioners.

Although a number of trainings of traditional healers in HIV/AIDS have been conducted in South Africa (Leclerc-Madlala, 2002), there have been no systematic evaluations

of HIV/AIDS care training for South African traditional healers. The current study was conducted to fill this void. We evaluated a traditional healer training model that was developed by the National Health Department (Dlamini et al., 2004). The aim of this study was to test whether the standard training increases knowledge, reduces risk practices, improve STI and HIV management strategies, and increases referrals to medical care among traditional healers in KwaZulu-Natal, South Africa.

## Method

### Participants and procedures

A total of 233 traditional healers were included in the study, with one refusal to participate. Traditional healers were assigned to an intervention ( $n = 160$ ) or control group ( $n = 73$ ) by choosing four different areas having both rural and urban representation. Consequently, healers in a rural area and an urban area were selected as intervention sites, and healers in one rural and one urban area were selected for the control group.

We used a quasi-experimental intervention design with traditional healers in four selected communities in KwaZulu-Natal, South Africa. Cluster sampling was used to include all traditional healers from four selected communities. Initial access was established through the Traditional Healers Council in KwaZulu-Natal and respective branches in the province. Traditional healers from both experimental and control sites were contacted through existing lists in branch offices and community meetings and were then invited to contact points for an interview. All traditional healers residing in the specific study areas were eligible to participate. From a total list of 234 traditional healers in the four selected areas, 233 were included in the study. Individual traditional healers were not randomly assigned to an experimental or control condition, but rather a whole cluster was assigned to conditions. The selection of clusters was guided by information from traditional healer’s branch offices and their training section on the availability of traditional healers in the area.

About a fifth of the traditional healers (19%) were male in the experimental arm, and just over a third were male (38%) in the control arm. Most traditional healers were Zulu in both experimental (96%) and control (97%) groups. In both conditions, more traditional healers were from rural areas (58% in experimental and 76% in control group) rather than urban areas. There were no significant differences in age, formal education and having a religious affiliation between experimental and control conditions (see Table 1).

Questionnaires were interviewer-administered in Zulu by two researchers, one traditional healer and one professional

**Table 1** Characteristics of South African Traditional Healers

	Exp ( <i>n</i> = 160)		Con ( <i>n</i> = 73)		$\chi^2$
	<i>N</i>	%	<i>N</i>	%	
Sex					
Male	30	18.8	28	38.4	11.83***
Female	130	81.3	45	61.6	
Ethnicity					
Zulu	154	96.3	70	97.2	7.05**
Xhosa	4	2.5	0	0	
Indian	2	1.3	1	1.4	
Afrikaans	0	0	1	1.4	
Locality					
Urban	66	41.3	17	23.3	7.05**
Rural	94	58.8	56	76.7	
Area					
Swayimane	94	58.8	0	0	4.56
Mbali	66	41.3	0	0	
Ulundi	0	0	17	23.3	
(urban)					
Ulundi	0	0	56	76.7	
(rural)					
Age					
<35 years	28	18.3	8	11.7	4.56
36–45	29	19.0	24	35.3	
46–55	56	36.6	20	29.4	
56 and more	40	26.2	16	23.5	
Formal education					
None	38	23.9	14	19.4	5.66
Grade 1–7	58	36.5	29	40.3	
Grade 8–12	61	38.3	27	37.3	
Postmatric (diploma, certificate)	2	1.3	2	2.8	
Religious affiliation					
Yes <sup>a</sup>	146	91.8	67	93.1	
No	13	8.2	5	6.9	

<sup>a</sup>In descending order of frequency: Zion Christian Church, Roman Catholic, African religion, Apostolic, Anglican, Methodist, Lutheran, and other Christian churches.

\*\**p* < .01, \*\*\**p* < .001.

nurse trained in administration of this interview schedule. Questionnaires were translated from English to Zulu by one researcher and back translated by another. Prior to the interview, each participant was informed about the anonymous procedures used in the study. To assure anonymity of responses, participants' names did not appear on any measures, and all data tracking was accomplished through a number-coding system. Participants were reimbursed for the transport costs to come to assessment and training sessions. In addition, they were provided with meals and refreshments. The study was conducted from January 2004 to March 2005.

## Experimental intervention

The intervention condition received training for 3.5 days led by one professional nurse and one traditional healer, and two researchers facilitated in the training. The component of the training of community health workers and nurses has been reported elsewhere (Peltzer, Mngqundaniso, & Petros, in press). The training manual had been pilot tested with two groups of healers (one urban and one rural)-who did not form part of the final sample. Training content was reviewed and revised by an expert committee and was tailored to cultural themes and gender-relevant contexts based on previous research. Training followed the standard model used in existing programs (Dlamini et al., 2004) that includes two sets of modules: (A) HIV/AIDS; Sexually transmitted infections; How to manage STI and HIV/AIDS; HIV/AIDS and family planning; TB; Nutrition; Infection control; Danger signs and symptoms; HIV/AIDS and mental illness; Herbal medicine. (B) Status and role of traditional health practitioners; Cultural perceptions of STI and HIV/AIDS; Communication and HIV risk reduction counseling; History taking, recording, collaboration and referral.

One set of sessions focused on information on HIV, STI, TB, nutrition and family planning, and motivation for risk-behavior reduction. Informational content included transmission routes, risk behaviors, condom use and effectiveness, a course on HIV infection, antibody testing and family planning methods. Motivational content included materials designed to enhance awareness of personal and patient's risk for infection. Further training focused on skills acquisition (e.g., condom demonstration, role plays on STI and HIV counseling, communication issues such as confidentiality of patient's diagnosis, how to give advice and phrase a referral letter).

Traditional healers were each provided with the following materials in the training: an educational manual, 100 razor blades, 100 condoms, and 100 pairs of gloves. At the end of each training course the traditional healers chose one representative who would then go to the clinic to ask for these materials when they ran out of them. Trainings took place in community halls within the respective study areas. Healers commuted daily to the training venue from their homes. In all six trainings were conducted (three in the urban and three in the rural study site), with an average attendance of 25 traditional healers; 85% of healers attended all sessions. At the end of the training, healers were given an attendance certificate. One follow-up session 2–3 months after the initial training was conducted, which 60% of the healers attended. The follow-up session was conducted by the trainers, to assist in generalizing the skills learned, review and clarify unanswered questions, and overcome the challenges they had experienced.

## Control condition

Participants assigned to the control condition completed assessments during the same periods as intervention participants. Control participant did not receive training but did receive an information booklet after the follow-up assessment interview. The pre- and post intervention assessments were conducted in community halls after healers had been invited twice through their peers to attend the assessment and information meetings.

## Outcome measures

A semi-structure questionnaire was developed from previous studies (Chipfakacha, 1997; Green, 1994; King & Homsy, 1997; Peltzer, 1998; Somsé et al., 1998; UNAIDS, 2002) and key informant interviews with five traditional healers who did not form part of the final sample. The questionnaire included the following components: socio-demographic data (8 items), practice characteristics (7 items), conditions treated (2 items), STI/HIV/AIDS and TB knowledge (23 items, rated as true, false or do not know; and 3 open-ended questions on known STIs, HIV symptoms and causes), HIV and STI management (12 items), HIV risk practices (7 items), attitudes towards biomedical health practitioners and referral pattern (17 items). Response options for all questions, if not stated differently, were “yes” or “no”.

The 13-item HIV/AIDS knowledge was internally consistent,  $\alpha = .72$  as was the 9-item HIV/STI management practices index,  $\alpha = .81$ . However, the 7-item TB knowledge index had a low internal consistency,  $\alpha = .50$ , and the 5-item risk index yielded an  $\alpha .48$ , demonstrating considerable construct heterogeneity.

## Data analysis

Descriptive statistics were used to obtain frequency distributions, Pearson's Chi-square, ANOVA and independent samples *t*-tests analysis of differences between groups, including completers and dropouts.

## Results

Of the 233 traditional healers in the study, 155 (67%) completed the 7–9 months follow-up interview; 66% intervention and 69% control. Those who completed the follow-up interviews were compared to dropouts on sex, age, registration with the healer's council, formal education, length of training undergone, years of practice, number of patients seen, HIV/AIDS training. We found that dropouts were more likely to have fewer years of practice and were seeing fewer patients a month.

## Practice characteristics of traditional healers

Almost half of the traditional healers (44%) were members of a healers association, and 43% were registered with the traditional health practitioner's council. Traditional healers were asked at pre-intervention about the five most common conditions they treated. By far the most commonly treated condition was STI (72%), followed by arthritis or rheumatism (43%), stroke (36%), headache (31%), sores (30%), children's problems (24%), ancestral problems (23%), sharp pains (22%), spirit illness (21%), and stomach problems (21%); only a few (6%) mentioned HIV/AIDS.

In both experimental and control groups most traditional healers could be classified as diviners (59% in the experimental and 39% in the control group), followed by herbalists (15% and 29% respectively) and diviner-herbalists (13% and 22% respectively). The age at which healers started practicing was older in the experimental group older (59% were 36 years and older) than in the control group (66% were 35 years and younger). Most traditional healers in both the intervention (53%) and control group (61%) indicated that their training had lasted for more than a year. Traditional healers in the control group (31%) had more often already received HIV/AIDS training than in the experimental group (15%).

## STI, HIV/AIDS, and TB knowledge

Although most healers had correct knowledge of the major HIV transmission routes, prevention methods, and ARV treatment, their knowledge was poorer on other HIV transmission routes such as breast feeding, oral sex, and dry sex, HIV/AIDS myths including having sex with a virgin, getting HIV by using a cup or plate that has been used by a person with HIV/AIDS, and the nature of HIV/AIDS such as being infected with HIV and still look healthy and that there is no cure for HIV/AIDS. ANOVA controlling for pre-intervention differences found a significant intervention effect for HIV knowledge,  $F(1, 153) = 8.09, p < .01$ . Regarding TB knowledge, almost all healers agreed that TB is curable and correctly said that the treatment takes 6 to 8 months to cure. Although most healers knew the transmission route, that is breathing the air around a person who is sick with TB, many had misconceptions about TB transmission, such as believing one can get TB from mosquito or other insect bites. An ANOVA controlling for pre-intervention differences did not find a significant intervention effect for TB knowledge,  $F(1, 153) = 3.12, ns$ , (see Table 2).

## HIV/STI management

The majority of the traditional healers knew or had improved knowledge of where to obtain HIV voluntary counseling

**Table 2** HIV/AIDS and Tuberculosis Knowledge in Correct Responses in Percent (The Response Options “True” were Rated as “1” and “False” or “Do Not Know” as “0”)

	Pre (%)		Follow-up (%)	
	Exp ( <i>n</i> = 160)	Con ( <i>n</i> = 73)	Exp ( <i>n</i> = 105)	Con ( <i>n</i> = 50)
1. A person can get HIV by using a cup or plate that has been used by a person with HIV/AIDS (false)	109 (68.3)	50 (69.0)	98 (92.5)	43 (86.0)
2. Having sex with a virgin can cure HIV/AIDS (false)	133 (82.6)	57 (78.9)	101 (96.2)	48 (96.2)
3. Having sex with more than one partner can increase a person's chance of being infected with HIV (true)	140 (87.6)	64 (88.4)	98 (93.4)	50 (100)
4. A person can be infected with HIV and still look healthy (true)	96 (60.2)	39 (54.3)	91 (86.6)	35 (70.0)
5. People can protect themselves from HIV by using a condom correctly every time they have sex (true)	139 (87.6)	69 (94.2)	103 (98.1)	50 (100)
6. You can get HIV through contact with infected blood (true)	146 (90.7)	68 (92.9)	102 (97.2)	46 (92.0)
7. A person can get HIV from oral sex (mouth-to-penis or mouth-to-vagina) (true)	122 (76.1)	49 (66.7)	82 (78.3)	34 (68.0)
8. HIV can be transmitted from mother to child through breast feeding (true)	121 (75.9)	55 (75.4)	87 (83.0)	39 (78.0)
9. Once one has started taking antiretroviral treatment for HIV/AIDS one has to take it forever (true)	140 (88.2)	67 (91.3)	100 (95.3)	41 (82.0)
10. Dry sex increases the risk of sexually transmitted infections (true)	103 (64.4)	45 (61.4)	82 (78.3)	33 (66.0)
11. Can the transmission of HIV from mother to child be prevented (true)	126 (78.6)	54 (74.3)	88 (84.0)	38 (76.0)
12. Can needles and razors transmit HIV (true)	150 (94.4)	71 (97.1)	99 (94.3)	46 (92.0)
13. There is no cure for HIV, the virus that causes AIDS (true)	117 (73.4)	66 (91.3)	98 (93.4)	39 (78.0)
Total mean (SD) ANOVA: Mean difference = .95, $F = 8.09, p < 0.01$	10.3 (2.1)	9.8 (1.8)	12.0 (2.2)	10.7 (1.8)
How is TB contracted or spread?				
1. Breathing the air around a person who is sick with TB (true)	133 (83.4)	56 (76.5)	97 (92.2)	42 (83.7)
2. Sharing eating/drinking utensils (true)	114 (71.2)	51 (69.6)	82 (78.1)	29 (58.0)
3. From mosquito or other insect bites (false)	29 (18.3)	20 (28.4)	24 (28.8)	14 (28.0)
4. TB can be cured (true)	149 (92.9)	72 (98.5)	102 (97.1)	49 (98.0)
5. You have to go to hospital to be cured (true)	146 (91.1)	71 (96.9)	102 (97.1)	49 (98.0)
6. Treatment takes years (false)	134 (84.1)	61 (83.9)	98 (93.3)	49 (98.0)
7. Treatment takes between 6 and 8 months (true)	146 (91.1)	71 (97.2)	100 (95.2)	50 (100)
Total mean (SD) ANOVA: Mean difference = .35, $F = 3.12, ns$	5.3 (1.3)	5.6 (0.8)	5.9 (0.8)	5.6 (0.8)

and testing (VCT). About half of the healers indicated that they had referred a patient for HIV testing in the past three months. For the HIV/STI management strategies healers in the intervention group improved significantly in terms of integrating partner referral in their STI management, conducting HIV/STI risk reduction counseling, had distributing condoms to their patients. Healers in the intervention had conducted community HIV/AIDS and STI education, and had been keeping records of their patients. An ANOVA controlling for pre-intervention differences found a significant intervention effect for HIV/STI management practices,  $F(1, 151) = 7.43, p < .001$  (see Table 3).

#### HIV risk practices

Most traditional healers indicated that they had performed incisions or scarifications and used an enema on their patients in the past three-months. ANOVA controlling for pre-intervention differences did not find a significant intervention effect for HIV risk practices,  $F(1, 151) = 4.25, ns$ . Less than 5% still reused enema equipment without sterilization in the past three months, 2% still used the same razor blade for scarifications on more than one patient, and 20% did not use gloves when carrying out scarifications (see Table 4). Follow-up interviews further showed that traditional healers

**Table 3** HIV/STI Management in Affirmative Responses

	Pre (%)		Follow-up (%)	
	Exp (n = 160)	Con (n = 73)	Exp (N = 105)	Con (N = 50)
1. Do you know where you can obtain voluntary HIV counseling and testing services?	125 (78)	51 (70)	100 (94)	46 (92)
2. Did you refer a patient for HIV testing in the past 3 months?	82 (51)	48 (66)	47 (45)	30 (60)
3. Did you do HIV/STI risk behavior assessment (e.g., ask about risky sex) in the past 3 months?	96 (60)	52 (71)	76 (72)	37 (74)
4. Did you do HIV/STI risk reduction counseling (e.g., advice on condom use, abstinence, fidelity and partner reduction) in the past 3 months?	122 (76)	71 (97)	89 (85)	40 (80)
5. Did you integrate partner referral in your STD treatment in the past 3 months?	88 (55)	39 (54)	68 (65)	29 (58)
6. Did you distribute condoms in the past 3 months?	129 (18)	34 (47)	91 (87)	23 (46)
7. Did you do HIV/AIDS/STI community education in the past 3 months?	43 (27)	28 (39)	57 (54)	21 (42)
8. Did you do home-based care in the past 3 months?	80 (50)	41 (56)	66 (63)	27 (54)
9. Did you keep records of patients in the past 3 months?	30 (19)	26 (36)	70 (67)	20 (38)
Total mean ANOVA: Mean difference = 1.41, $F = 17.43, p < 0.01$	4.4 (2.6)	5.5 (2.5)	6.7 (2.3)	5.3 (2.3)

complained that the clinics had no stock of materials including the razor blades and gloves when they went to ask for them.

#### Attitudes towards biomedical health practitioners and referral pattern

Almost all traditional healers indicated at baseline (98% in the experimental and 99% in the control group) and at follow-up (99% in the experimental and 100% in control

**Table 4** HIV Risk Practices at the Work Place in Affirmative Responses

	Pre (%)		Follow-up (%)	
	Exp (n = 160)	Con (n = 73)	Exp (N = 105)	Con (N = 50)
Level of practice				
1. Did you perform incisions or scarifications at least once on a patient in the past 3 months?	114 (40.5)	57 (77.5)	86 (81.9)	42 (84.0)
2. Did you use an enema at least once with a patient in the past 3 months?	69 (42.5)	42 (57.1)	54 (51.4)	38 (76.0)
HIV risk practice				
1. Did you reuse enema equipment without sterilization in the past 3 months?	14 (9.0)	6 (8.5)	5 (4.8)	1 (2.0)
2. Did you use the same razor blade to perform incisions or scarifications on more than one patient in the past 3 months?	7 (4.5)	3 (4.2)	2 (1.9)	1 (2.0)
3. Did you use gloves when carrying out incisions or scarifications in the past 3 months? (reverse coded)	66 (41.3)	21 (29.2)	22 (21.0)	9 (18.0)
4. Do you have a supply of gloves to protect you against infection? (reverse coded)	101 (63.1)	31 (41.8)	16 (15.1)	27 (54.0)
5. Do you have a container where you keep used blades after completing a procedure? (reverse coded)	83 (51.2)	26 (34.8)	24 (23.0)	24 (48.0)
Total mean (range 0–5) ANOVA: Mean difference = .22, $F = 4.25, ns$	1.7 (1.1)	1.3 (1.0)	1.2 (0.9)	1.4 (0.9)

group) that they were prepared to work with biomedical health practitioners. Likewise most traditional healers at baseline (88% in the experimental and 89% in the control group) and at follow-up (90% and 90% respectively) felt confident to work with biomedical health practitioners, and most at baseline (96% in the experimental and 85% in the control group) and at follow-up (98% and 86% respectively) were likely to refer or recommend a patient to a biomedical

health practitioner in the future. The most common type of conditions traditional healers referred to a clinic or hospital included firstly body weakness, TB, and HIV/AIDS, and secondly arthritis, family planning, STIs, cancer, sores/shingles and injury/fracture, which did not change from pre-test to follow-up.

Forty-three percent of the healers in the experimental group indicated at pre-test that they had referred patients to a biomedical health worker in the past three months, which stayed the same at follow-up (44%); while healers in the control group had higher levels of referrals. A minority of healers in both experimental and control group indicated that they had received patients referred by the clinic or hospital (11%). The referral to (50% pre, 84%, post) and receiving referrals from other traditional healers (50% pre, 70% post) was more common than referrals to and from the biomedical health system. Likewise the consultation of another traditional healer on a patient's problem (55% at pre, 82% at post) was more common than consultation with a biomedical health worker (27% pre, 36% post).

## Discussion

We implemented and evaluated an HIV/STI prevention and care training program for traditional healers in rural and urban KwaZulu-Natal, South Africa. Following the training traditional healers in this study significantly improved their HIV/AIDS, and to a lesser extent, their TB knowledge. Some myths of HIV and TB transmission remained unchanged and will require more intensive training. Nevertheless, our study findings are similar to those that has previously reported significant improvement of HIV/AIDS knowledge among healers after training (Somsé et al., 1998). We found that in the training sessions also improved HIV and other STI management strategies, including risk behavior assessment, risk reduction counseling, condom distribution, community education, and record keeping.

Traditional healers address some of the major behavioral risk and protective factors with their patients, including partner reduction and condom distribution. Therefore, traditional healers may be more widely utilized in HIV prevention program, perhaps as risk reduction counselors and in collaboration with biomedical health practitioners on matters of community-level education. Considering that the largest group of traditional healers in our study were diviners who were mostly female, they could possibly provide support to other women, given the gendered nature of the HIV epidemic in South Africa, and the need for strategies to enhance women's ability to protect themselves.

Traditional healers indicated that they had recently performed incisions or scarifications and used an enema on their patients. Making incisions and punctures in the skin for the

purpose of introducing medication is a widely used technique in traditional Zulu medicine, as confirmed by other studies (Jolles & Jolles, 2000). However, the intervention effects for the reduction of HIV risk practices were not entirely successful, with 5% still reusing enema equipment without sterilization, 2% using the same razor blade for scarifications on more than one patient, and 20% not using gloves when carrying out scarifications. Similar practices were found among healers in Zimbabwe after a similar training intervention (Wellington, Chingono, Rusakaniko, & Willms, 1997). Some of these practices may be rooted in culture and thus difficult to change, and also require the availability of gloves and new razor blades. Both need to be sufficiently addressed in further training programs.

We also found a high preparedness to work with and refer patients to biomedical health practitioners, yet referral to biomedical practitioners did not increase following the training. It is possible that despite the collaborative training module with biomedical health workers and emphasizing the importance of referral, traditional healers remained reluctant to refer more patients to the biomedical health sector. Other studies found increased HIV and other STI referral after training healers (Green et al., 1995). Improving referrals from healers to biomedical providers should be the subject of future intervention research that can focus on how to overcome barriers, including low literacy among healers, to improve modes and mechanisms of referral.

The current study had several important limitations. The sample of traditional healers included was only representative of small selected geographic areas in KwaZulu-Natal, South Africa. Assessments relied on self-report from traditional healers only, and did not include patients, onsite checks of condom, gloves or razor blade availability. The study also used a quasi-experimental design rather than a true randomized design, so the potential confounding was high. Also, we observed baseline differences across conditions on some key variables, also speaking to the limitations of our non-randomized design. The follow up of healers was low, with a response rate of 66% among the experimental and 69% among the control group. There were not multiple follow-up assessments so the effects of the training may have diminished after the long follow-up interval. Some knowledge levels were already high in the sample and did not have much room for improvement. This study only included traditional healers and there is a need to conduct similar programs and studies with faith healers.

We conclude that traditional healers improved and retained their knowledge of HIV/AIDS, STI, and TB as much as 7–9 months after the training. Healers also reduced their HIV risk practices and played an important role in providing culturally acceptable STI and HIV/AIDS assessment, counseling, community education, and distribution of condoms.

Healers' contributions could be further strengthened by involving them in future HIV/AIDS programs.

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