HHS Public Access

Author manuscript

Sex Transm Dis. Author manuscript; available in PMC 2019 September 23.

Published in final edited form as:

Sex Transm Dis. 2016 January ; 43(1): 23–29. doi:10.1097/OLQ.0000000000000383.

Quality of Sexually Transmitted Infection Case Management Services in Gauteng Province, South Africa: An Evaluation of Health Providers' Knowledge, Attitudes, and Practices

David Cal Ham, MD, MPH[*], **Susan Hariri, PHD**[†], **Mary Kamb, MD, MPH**[†], **Jennifer Mark, MPH**[‡], **Ricky Ilunga, MBChB, BBiomedSc**[§], **Sara Forhan, MD, MPH**[¶], **Mupatal Likibi, MD**[||], **David A. Lewis, FRCP, PHD**[**,††]

[*]Division of HIV/AIDS Prevention and Centers for Disease Control and Prevention (CDC), Atlanta, GA;

[†]Division of STD Prevention, Centers for Disease Control and Prevention (CDC), Atlanta, GA;

[‡]University of Washington, Seattle, WA;

[§]National Institute for Communicable Diseases of National Health Laboratory Services, Johannesburg, South Africa;

[¶]Division of CDC, Division of Global HIV/AIDS, Atlanta, GA;

[||]Alexandra Community Health Centre, Johannesburg, South Africa;

[**]Centre for HIVand STIs, National Institute for Communicable Diseases (NHLS), Sandringham, South Africa;

[††]Centre for Infectious Diseases and Microbiology & Marie Bashir Institute for Infectious Diseases and Biosecurity, Westmead Clinical School, University of Sydney, Sydney, New South Wales, Australia eases and Microbiology & Marie Bashir Institute for Infectious Diseases and Biosecurity, Westmead Clinical School, University of Sydney, Sydney, New South Wales, Australia

Abstract

Background: The sexually transmitted infection (STI) clinical encounter is an opportunity to identify current and prevent new HIV and STI infections. We examined knowledge, attitudes, and practices regarding STIs and HIV among public and private providers in a large province in South Africa with a high disease burden.

Methods: From November 2008 to March 2009, 611 doctors and nurses from 120 public and 52 private clinics serving patients with STIs in Gauteng Province completed an anonymous, self-administered survey. Responses were compared by clinic location, provider type, and level of training.

Results: Most respondents were nurses (91%) and female (89%), were from public clinics (91%), and had received formal STI training (67%). Most (88%) correctly identified all of the

Correspondence: David Cal Ham, MD, MPH, Division of HIV/AIDS Prevention, Centers for Disease Control and Prevention (CDC), 1600 Clifton Rd NE, Mailstop E-27, Atlanta, GA 30329. Ink4@CDC.gov.

The authors have no conflicts of interest to disclose.

common STI syndromes (i.e., genital ulcer syndrome, urethral discharge syndrome, and vaginal discharge syndrome). However, almost none correctly identified the most common etiologies for all 3 of these syndromes (0.8%), or the recommended first or alternative treatment regimens for all syndromes (0.8%). Very few (6%) providers correctly answered the 14 basic STI knowledge questions. Providers reporting formal STI training were more likely to identify correctly all 3 STI syndromes ($P = 0.034$) as well as answer correctly all 14 general STI knowledge questions ($P = 0.016$) compared with those not reporting STI training. In addition, several providers reported negative attitudes about patients with STI that may have affected their ability to practice optimal STI management.

Conclusions: Sexually transmitted infection general knowledge was suboptimal, particularly among providers without STI training. Provider training and brief refresher courses on specific aspects of diagnosis and management may benefit HIV/STI clinical care and prevention in Gauteng Province.

With an estimated 5.7 million infections and approximately 12% prevalence, South Africa has the largest HIV epidemic in the world.[1] Sexually transmitted infections (STIs), particularly those causing genital ulcers or mucosal inflammation, are associated with increased risk of HIV transmission and acquisition.[2–13] Sexually transmitted infections are markers of risk behaviors for acquiring or transmitting HIV. Therefore, in addition to preventing adverse health outcomes related to STIs, the STI clinical encounter is an important opportunity to prevent HIV infection.

Previous studies in South Africa suggest that many symptomatic patients with STIs report high-risk sexual behaviors and are coinfected with HIV (often unrecognized).[13–15] The importance of STI management for HIV prevention has been recognized in South Africa's health guidance policies. The *National Department of Health's HIV and AIDS and STI Strategic Plan for South Africa 2007–2011* prioritized increased access to quality STI services, noting the priority of adequate training for health providers on national syndromic management guidelines.[16,17] Nonetheless, previous studies have found evidence that STI case management approaches in South Africa can be inconsistently or ineffectively provided.[18–21] These findings underscore a need to better understand current gaps and potential means for improving STI care services.

In an effort to improve basic STI management and HIV prevention, we conducted this study to evaluate health providers' knowledge, attitudes, and practices around STI services, including HIV/STI prevention practices, in Gauteng Province, South Africa.

MATERIALS AND METHODS

Study Setting

This cross-sectional study was conducted from November 2008 to March 2009 among a sample of public and private providers in Gauteng Province, South Africa's most populous province. Gauteng Province is composed of 6 major municipalities including 3 metropolitan (Johannesburg, Tshwane, Ekurhuleni) and 3 rural (Metsweding, Sedibeng, and West Rand) districts.

Study Population

We obtained a list of all health care facilities in Gauteng Province that reported STIs to the National Department of Health in 2007, which included 368 public outpatient health care facilities and 372 private facilities (740 total). Of these, we selected the public facilities that reported at least 100 STI cases in 2007 (n = 317) and all private facilities that reported any STIs that year (n = 372); these 689 facilities we considered eligible for the study. We selected public clinics that reported at least 100 STI cases and private clinics who reported at least 1 STI case because public clinics were typically much larger facilities, with many more providers seeing patients with STIs. All private facilities were included in the sampling frame because only 1 or 2 providers comprised each practice. We limited the number of public clinics due to budget and logistical constraints. We stratified these 689 facilities into either metropolitan (municipalities of Johannesburg, Tshwane, and Ekhuruleni) or rural (municipalities of Metsweding, Sedibeng, and West Rand) districts based on their location.

Within each district stratum, we selected at least one public and one private facility from each municipality to insure both types of facilities were represented within each municipality. Using annual number of STI cases reported by a facility as a proxy for the total number of providers who practiced there, public facilities were sampled proportional to the number of STI cases reported by each facility. Private facilities were selected within each stratum using simple random sample design. Providers in the selected facilities were recruited in a 3:1 ratio from public and private facilities, respectively, to represent the distribution of the municipality population's use of services by clinic type. We invited a total sample size of 200 facilities (120 public and 80 private) to participate based on the assumption that it would be possible to recruit 2 provider participants per public facility and 1 per private facility. From these 200 facilities, we recruited eligible providers to complete the study survey.

Survey Design/Administration

A study coordinator traveled to selected facilities to recruit providers to participate in the study and deliver the paper-based surveys to participants. Providers (physicians or nurses) were eligible if they reported routinely providing patient care at least 8 hours per week, primarily caring for sexually active patients between the ages of 14 and 55 years (at least half of their patients), and seeing at least 9 patients with STI symptoms per month. Recruited providers gave informed consent to participate in the survey and completed an anonymous, self-administered survey in a private location within the clinic. Providers were not compensated for their participation, as this was deemed to be part of their responsibility per Gauteng Ministry of Health.

The structured paper-based survey, which was designed by STI experts and pilot tested in Gauteng Province before implementation, consisted of a series of case studies regarding the 3 common STI syndromes: genital ulcer syndrome (GUS), male urethral discharge syndrome (UDS), and vaginal discharge syndrome (VDS). Participants were shown color photographs of classic clinical manifestations of each of the 3 STI syndromes as well as a photograph of classic vesicular eruptions found in genital herpes infection. Patient histories were then presented, and participants were asked to choose from a list of possible responses

about (1) the syndrome represented, (2) possible infectious etiologies, and (3) the proper treatment of the syndrome. Participants were also asked basic questions about their attitudes and beliefs regarding patients with STIs and their clinical practices, including clinical examination and basic management strategies of patients with STIs. Clinical practice questions included STI/HIV counseling or other prevention practices.

This study was approved by the University of Witswatersrand's Human Research Ethics Committee and by respective national, district, and local health departments.

Statistical Analysis

Survey data were transferred to an electronic database using double-data entry and analyzed using SPSS 21 (IBM, Armonk, NY). We used χ^2 or Fisher exact tests to compare responses between public and private providers, metropolitan and rural providers, physicians and nurses, and male and female providers on STI management knowledge, practices, and attitudes. We compared providers' responses based on facility type (urban, rural; public, private), reported STI training status (completed specialized, formal courses in STI/HIV management; completed on the job professional training, and no training), when STI training was received (within 5 years, >5 years), and how many patients with STI they reported seeing per week (<30, ≥30). For the knowledge and attitude questions, we considered nonresponse and answers of "don't know" and "missing" as incorrect responses.

RESULTS

A total of 565 public providers at 120 public facilities were invited to participate, of which 565 (100%) agreed. From private facilities, 80 providers at separate facilities were invited to participate, of which 52 (65%) agreed. Within the 172 participating facilities, 617 potentially eligible providers agreed to undertake the survey. On review, 6 providers did not meet the eligibility criteria and were not included in this analysis after completing the survey. The results reflect data from 611 providers. At least 1 provider from each facility participated in the study. The number of public facility providers who completed surveys ranged from 1 to 10, with a median of 2.5 per facility.

Characteristics of Respondents

Among the 611 eligible providers whose survey data were analyzed, 559 (91%) worked in public and 52 (9%) worked in private facilities. Most of providers were female (89%) and nurses (91%; Table 1). Most physicians (85%) worked at private facilities, whereas most nurses (99%) worked at public facilities. Most participants reported having had formal training in STI (67%) or HIV management (76%), and many had training in both (58%).

STI Management Knowledge

Overall, most of the 611 providers correctly recognized the 3 classic STI syndromes: 95% correctly identified GUS, 92% identified male UDS, and 97% identified VDS (Table 2). All 3 syndromes were correctly identified by 88% of providers. Providers with formal STI training were more likely than providers with no formal STI training to correctly identify all 3 syndromes (90% vs. 84%, $P = 0.034$; Fig. 1).

Only 7% of 611 providers correctly identified the 3 major causes of GUS (herpes simplex virus, *Treponema pallidum, Haemophilus ducreyi*); 7% identified the 3 major causes of UDS (*Neisseria gonorrhoeae, Chlamydia trachomatis, Trichomonas vaginalis*); 9% identified the 5 major causes of VDS (bacterial vaginosis, *T. vaginalis, N. gonorrhoeae, C. trachomatis*, candidiasis); and 0.8% of respondents correctly identified all of these. After removing less common causes, the more common causes of GUS (genital herpes and syphilis), UDS (gonorrhea and chlamydia), and VDS (trichomoniasis, bacterial vaginosis, and candidiasis) were recognized by 12%, 10%, and 37% of the 611 participants, respectively. On the other hand, 90% of providers correctly identified the photograph of vesicular lesions as being most likely caused by genital herpes infection. For this question on the identification of vesicular lesions being caused by genital herpes, physicians were more likely to respond correctly than nurses (98% vs. 89%), providers with formal training more likely to respond correctly than those without (94% vs. 81%), and metropolitan providers more like to respond correctly than rural providers (93% vs. 76%). Private providers were more likely than public providers to correctly identify the causes of GUS and VDS, as were physicians compared with nurses, and those with STI training compared with those without (Table 2).

Regarding STI management, 29% of all providers correctly identified the recommended first-line or alternative treatment regimens for GUS; 40% correctly identified the recommended regimens for UDS, and 6% correctly identified the recommended regimens for VDS. Five providers (0.8%) correctly identified the first or alternative regimens for all 3 syndromes. Approximately half (47%) of all providers correctly identified the recommended treatment of a genital herpes lesion. Incorrect treatments were selected by 71% of 611 providers for GUS, 60% for male UDS, and 51% for VDS. Correct identification of the recommended treatment regimens for GUS and UDS was more common among public compared with private providers, nurses compared with physicians, and providers with both HIV and STI training compared with those without (Table 2).

STI General Knowledge

Overall 53% of the 611 providers incorrectly believed herpes to be curable and 15% believed it was not treatable. Less than half (48%) correctly agreed that “some STIs cannot be cured by medication(s).” In addition, although almost all (97%) believed that an HIV test should always be recommended to a patient with an STI, some respondents lacked basic understanding of the natural history of HIV and other STIs. For example, 15% thought it was possible to tell if someone has HIV “just by looking at him/her,” 12% thought a person could develop AIDS even if he/she was not infected with HIV, and 39% thought untreated STIs “can develop into AIDS.” Less than half (42%) believed that “many patients with STIs already have HIV”; 20% thought or were unsure if HIV could be cured by traditional herbal medicine; 10% thought HIV could be prevented by proper nutrition; and 5% thought HIV could be prevented by washing thoroughly after unprotected sex.

Overall 6% of the 611 providers answered all 14 STI general knowledge questions correctly, in accordance with information provided in standard STI training courses. Physicians were more likely than nurses (13% vs. 5%, $P = 0.025$) to answer all 14 questions correctly, as were private providers compared with public providers (14% vs. 5%, $P = 0.020$) and those

who had received formal STI training compared with those who had not (7% vs. 3%, $P = 0.016$; Fig. 1).

Provider Practices for STI Patients

Providers were asked to choose from a list of potential management practices for different clinical scenarios. If presented with a patient who complained of vaginal discharge, 3% of the 611 providers reported that they would not ask about the discharge characteristics or duration, 4% would not ask about abdominal pain, 7% would not ask about contraception or whether the patient might be pregnant, 7% would not ask the patient whether she had ever been tested for HIV, 9% would not examine the cervix using a speculum, and 6% would not perform a bimanual examination to assess for cervical motion tenderness. Previous formal STI training was associated with report of correctly practicing all (6) of these components of an STI patient history and physical examination for a patient complaining of vaginal discharge (86% vs. 74%, $P = 0.001$; Fig. 1).

Provider Attitudes

Providers with STI training tended to have more positive attitudes toward patients with STI, condom use, and STI management (Table 3). Male providers were more likely than female providers to report that most of their male patients were willing to discuss symptoms (57% vs. 42%) and have genital examinations (79% vs. 50%). Male providers were also more likely to want to examine male genitalia (92% vs. 77%). On the other hand, female providers were more likely than male providers to report that most of their female patients were willing to have genital examinations (83% vs. 73%; Table 3). Overall, 12% of providers reported they preferred not to deal with patients with STI, 18% did not agree with providing male condoms to women, and 8% did not agree it was important to have sex partners treated.

Barriers to STI Care

When asked to describe barriers to STI care and potential resources that might help them provide better care, the most common provider response was that more time was needed to counsel patients (86%), followed by a need for job aids/education pamphlets (81%), visual aids (80%), and a more consistent supply of STI medications (79%).

DISCUSSION

Our findings indicate that responses about STI case management did not meet the standards outlined by the World Health Organization and the South African Department of Health.[22,23] Among surveyed doctors and nurses who were routinely providing STI services, most could identify all 3 common STI syndromes; however, more than 10% could not. GUD in particular is often associated with acute HIV infection[24] and each provider visit for GUD and other STI syndromes represent a critical opportunities for HIV prevention.[14,25] In addition, most providers were unable to identify the common causes of syndromes, perhaps reflecting lack of etiologic training in current syndromic management courses. It was also concerning that when presented with a list of treatment options for various STI syndromes, more than half of providers did not choose treatment regimens that are recommended in the National STI management guidelines. A possible explanation for this could be that the

National STI guidelines were updated earlier in 2008, the year this study was conducted, and some providers may not have seen the new recommendations. However, many providers selected ineffective treatment regimens that were not recommended in any previous guidelines (e.g., not providing empiric penicillin treatment of GUS). General knowledge about STIs was also lacking among those surveyed, with only 6% correctly answering all of the basic knowledge questions.

Providers often chose responses that were inappropriate or incomplete regarding STI patient histories and physical examinations. In addition, several providers reported negative attitudes toward STI management and patients with STIs, in general including preferring not to deal with patients with STIs, not agreeing with providing male condoms to women, and not agreeing that it was important to have sex partners treated. Many female providers admitted they did not want to examine male genitalia or felt men would refuse an examination. These self-reported findings correspond with previously published patient reports about lack of genital examination and feeling marginalized or scolded by providers.[19]

Our results suggest that clinics may be inadequately addressing men who present with STI symptoms, with many providers preferring not to examine male genitalia (both doctors and nurses). These findings are particularly concerning because male patients with GUS or UDS may not describe their symptoms correctly and, without a clinical examination, these critical syndromes may be overlooked and opportunities for HIV prevention missed. Negative provider attitudes toward male patients with STIs could dissuade some men from seeking STI services or participating in the partner notification process for STIs.

The survey yielded some positive findings. In general, providers with STI training had greater STI knowledge and more adequate practices and attitudes. In addition, most providers, regardless of STI training status, promoted HIV testing for patients with STIs.

The previously published literature on STI management in South Africa is consistent with our findings that provider practices are suboptimal and that training is associated with better STI care.[18–21] One study, a small randomized controlled trial conducted in 2000 at 5 matched-pair clinics in South Africa, that evaluated the use of syndrome health packets and provider training to improve STI services showed that the intervention clinics provided significantly better STI case management after the intervention than did control clinics.[26] However, to date, no evaluations have been published on STI management among providers in South Africa comparing public versus private and urban versus rural providers.

Our study adds to the existing literature by evaluating knowledge, attitudes, and practices among a large number of public and private STI providers, including nurses and physicians, in rural and metropolitan clinics in South Africa. In addition, we analyzed factors associated with improved provider performance to guide future STI and HIV prevention strategies. Our findings suggest that additional, high-quality provider STI education and training may be beneficial in Gauteng Province, as the providers with STI training reported more correct results in essentially every area. In addition to formal training, other strategies that would ensure service quality could be considered. For example, shorter “refresher” modules (e.g., periodically over the lunch hour) may allow providers to improve practices without the costs

and logistical difficulties associated with formal training courses. Occasional provider meetings to discuss difficult cases and situations could also promote improved provider practices.

This study had some limitations. We were unable to find previously validated survey questions for use in South Africa, and questions asked may not reflect the most important issues faced in South Africa. The survey was administered to a limited sample of providers in Gauteng Province, and results may not be generalizable to all providers in Gauteng or in other settings within or outside South Africa. Responses to survey questions were self-reported and may reflect what the participants thought they should answer rather than their actual practices and attitudes. On the other hand, the strength of our study included its large sample size of STI providers from a broad representation of clinics and clinical settings around Gauteng Province.

Although this study was conducted in one province in South Africa, it is likely that providers in other developing countries face similar challenges and knowledge gaps around effective STI management. To improve STI-related care, local and national programs could consider prioritizing development and implementation of well-structured training programs for STI providers that address local attitudes, beliefs, and misperceptions and the importance of the history and physical examination. These training programs should include appropriate job aids that help simplify correct management and STI treatment, and involve ongoing quality assurance strategies.

Acknowledgments

Funding for the study was provided by the Division of STD Preventions, Centers for Disease Control and Prevention.

REFERENCES

1. Shisana O, Rehle Tk, Simbayi LC, et al. South African National HIV Prevalence, Incidence and Behaviour Survey, 2012. Cape Town, South Africa: HSRC Press; 2012.
2. Cameron DW, Simonsen JN, D'Costa LJ, et al. Female to male transmission of human immunodeficiency virus type 1: Risk factors for seroconversion in men. Lancet 1989; 2:403–407. [PubMed: 2569597]
3. Telzak EE, Chiasson MA, Bevier PJ, et al. HIV-1 seroconversion in patients with and without genital ulcer disease. A prospective study. Ann Intern Med 1993; 119:1181–1186. [PubMed: 8239249]
4. Plummer FA, Simonsen JN, Cameron DW, et al. Cofactors in malefemale sexual transmission of human immunodeficiency virus type 1. J Infect Dis 1991; 163:233–239. [PubMed: 1988508]
5. De Vincenzi I A longitudinal study of human immunodeficiency virus transmission by heterosexual partners. European Study Group on Heterosexual Transmission of HIV. N Engl J Med 1994; 331:341–346. [PubMed: 8028613]
6. Kassler WJ, Zenilman JM, Erickson B, et al. Seroconversion in patients attending sexually transmitted disease clinics. AIDS 1994; 8:351–355. [PubMed: 8031513]
7. Otten MW Jr, Zaidi AA, Peterman TA, et al. High rate of HIV seroconversion among patients attending urban sexually transmitted disease clinics. AIDS 1994; 8:549–553. [PubMed: 8011261]
8. Craib KJ, Meddings DR, Strathdee SA, et al. Rectal gonorrhoea as an independent risk factor for HIV infection in a cohort of homosexual men. Genitourin Med 1995; 71:150–154. [PubMed: 7635489]

9. Laga M, Alary M, Nzila N, et al. Condom promotion, sexually transmitted diseases treatment, and declining incidence of HIV-1 infection in female Zairian sex workers. Lancet 1994; 344:246–248. [PubMed: 7913164]
10. Mehendale SM, Rodrigues JJ, Brookmeyer RS, et al. Incidence and predictors of human immunodeficiency virus type 1 seroconversion in patients attending sexually transmitted disease clinics in India. J Infect Dis 1995; 172:1486–1491. [PubMed: 7594707]
11. Cohen MS, Hoffman IF, Royce RA, et al. Reduction of concentration of HIV-1 in semen after treatment of urethritis: Implications for prevention of sexual transmission of HIV-1. AIDSCAP Malawi Research Group. Lancet 1997; 28(349):1868–1873.
12. Zetola NM, Bernstein KT, Wong E, et al. Exploring the relationship between sexually transmitted diseases and HIVacquisition by using different study designs. J AcqUir Immune Defic Syndr 2009; 50:546–551. [PubMed: 19367993]
13. Paz Bailey G, Sternberg M, Lewis DA, et al. Acute HIV infections among men with genital ulcer disease in South Africa. J Infect Dis 2010; 201:1811–1815. [PubMed: 20443734]
14. Paz-Bailey G, Sternberg M, Puren AJ, et al. Improvement in healing and reduction in HIV shedding with episodic acyclovir therapy as part of syndromic management among men: A randomized, controlled trial. J Infect Dis 2009; 200:1039–1049. [PubMed: 19715417]
15. Lewis DA, Chirwa TF, Msimang VM, et al. Urethritis/cervicitis pathogen prevalence and associated risk factors among asymptomatic HIV-infected patients in South Africa. Sex Transm Dis 2012; 39:531–536. [PubMed: 22706215]
16. National Department of Health, HIV & AIDS and STI Strategic Plan for South Africa, 2007–2011. Available at: http://www.nastad.org/Docs/Public/Resource/2009413_National%20Strategic%20Plan%202007%20-%202011(SANAC%202007).pdf. Accessed October 22, 2014.
17. South Africa National AIDS and STD Programme. The Diagnosis and Management of Sexually Transmitted Infections in Southern Africa, 3rd ed. Johannesburg, South Africa: Reference Centre for STDs, South African Institute for Medical Research; 2000.
18. Leichliter JS, Paz-Bailey G, Friedman AL, et al. 'Clinics aren't meant for men': Sexual health care access and seeking behaviours among men in Gauteng province, South Africa. SAHARA J 2011; 8:82–88. [PubMed: 23237685]
19. Schneider H, Blaauw D, Dartnall E, et al. STD care in the South African private health sector. S Afr Med J 2001; 91:151–156. [PubMed: 11288398]
20. Mathews C, van Rensburg A, Schierhout G, et al. An assessment of care provided by a public sector STD clinic in Cape Town. Int J STD AIDS 1998; 9:689–694. [PubMed: 9863583]
21. Harrison A, Wilkinson D, Lurie M, et al. Improving quality of sexually transmitted disease case management in rural South Africa. AIDS 1998; 12:2329–2335. [PubMed: 9863876]
22. Department of Health Republic of South Africa. First Line Comprehensive Management and Control of Sexually Transmitted Infections, 2008. Johannesburg, South Africa: Department of Health Republic of South Africa; 2008.
23. WHO Global Strategy for the Prevention and Control of Sexually Transmitted Infections: 2006–2015. 2007 Available at http://www.who.int/reproductivehealth/publications/rtis/9789241563475/en/. Accessed October 22, 2014.
24. Pilcher CD, Price MA, Hoffman IF, et al. Frequent detection of acute primary HIV Infection in Men in Malawi. AIDS 2004; 18:517–524. [PubMed: 15090805]
25. Mhlongo S, Magooa P, Müller EE, et al. Etiology and STI/HIV coinfections among patients with urethral and vaginal discharge syndromes in South Africa. Sex Transm Dis 2010; 37:566–570. [PubMed: 20502394]
26. Harrison A, Karim SA, Floyd K, et al. Syndrome packets and health worker training improve sexually transmitted disease case management in rural South Africa: Randomized controlled trial. AIDS 2000; 14:2769–2779. [PubMed: 11125896]

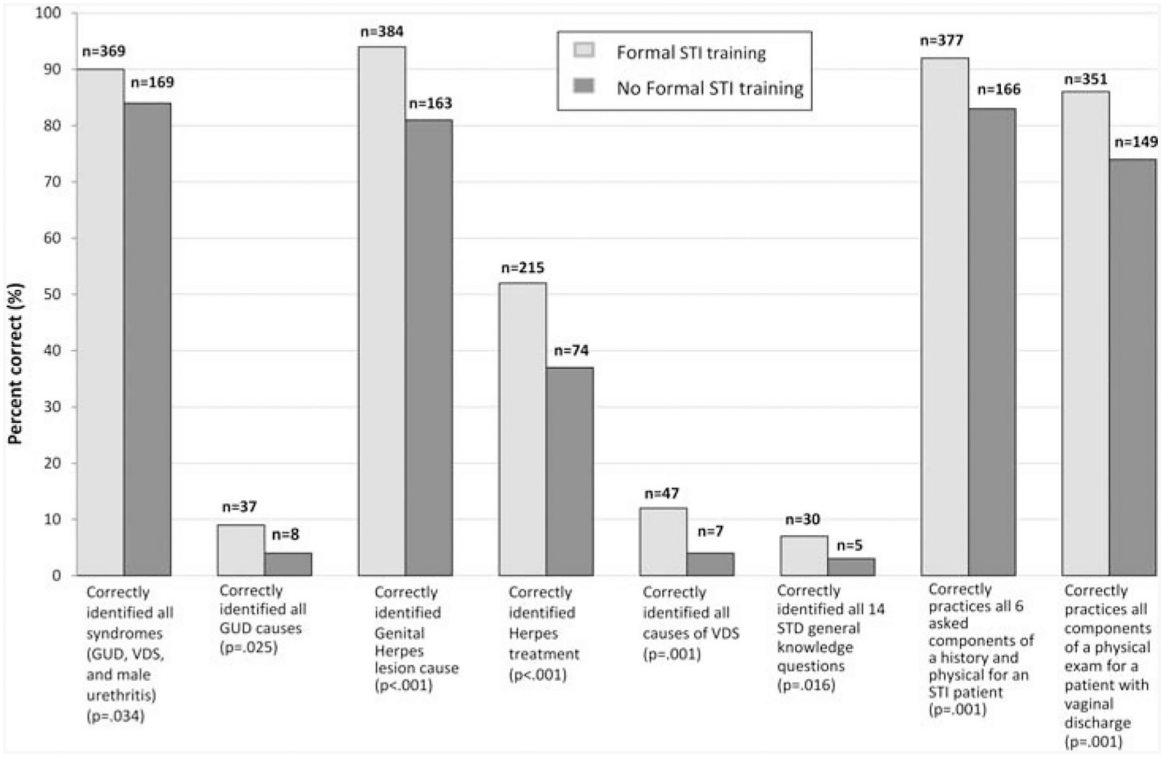

FIGURE 1.

The importance of formal STI training. Statistically significant differences in STI management knowledge, STI general knowledge, and provider practices by STI training status.

TABLE 1.

Characteristics of STI Service Providers

Characteristics		Public (n = 559)	Private (n = 52)	Total (n = 611)
District type, n (%)	Rural	104 (19)	14 (27)	118 (19)
	Urban	455 (81)	38 (73)	493 (81)
Profession, n (%)	Doctor	8 (1)	45 (87)	53 (9)
	Nurse	551 (99)	7 (13)	558 (91)
Sex, n (%)	Male	35 (6)	32 (62)	67 (11)
	Female	524 (94)	20 (38)	544 (89)
Years working in profession, median (IQR)		14 (8–20)	20 (10–30)	14 (8–21)
Years caring for patients with STIs, median (IQR)		8 (4–12)	15 (6–29)	8 (4–14)
Received formal STI training (i.e., classroom learning; n = 611), n (%)		374 (67)	36 (69)	410 (67)
STI training as professional training (i.e., on-the-job training; n = 406), n (%)		324 (87)	32 (91)	356 (88)
When received STI training (n = 408), n (%)	Within 5 y	225 (61)	12 (33)	237 (58)
	5–10 y	108 (29)	12 (33)	120 (29)
	>10 y	39 (10)	12 (33)	51 (13)
Received formal HIV training; n = 611), n (%)		423 (76)	40 (77)	463 (76)
HIV training as professional training (n = 460), n (%)		315 (75)	27 (68)	342 (74)
When received HIV training (n = 458), n (%)	Within 5 y	329 (79)	30 (75)	359 (78)
	5–10 y	73 (17)	9 (22)	82 (18)
	>10 y	16 (4)	1 (3)	17 (4)
No. patients with STI per day (n = 590), median (IQR)		6 (5–10)	3 (2–5)	6 (4–10)

TABLE 2.

STI Syndromic Identification and Treatment

			Type		Formal STI Training			STI/HIV Training			Profession		Location	
Correctly	**Identified**	**Total (n = 611), n (%)**	**Public (n = 559), n (%)**	**Private (n = 52), n (%)**	**Yes (n = 410), n (%)**	**No (n = 201), n (%)**	**Neither (n = 92), n (%)**	**HIV (n = 109), n (%)**	**STI (n = 56), n (%)**	**Both (n = 354), n (%)**	**MD (n = 53), n (%)**	**Nurse (n = 558), n (%)**	**Metro (n = 493), n (%)**	**Rural (n = 118), n (%)**
GUS	Syndrome	583 (95)	533 (95)	50 (96)	396 (97) *	187 (93)	84 (91)	103 (95)	52 (93)	344 (97) *	51 (96)	532 (95)	471 (96)	112 (95)
	Syndrome causes	45 (7)	35 (6)	10 (19) *	37 (9) *	8 (4)	4 (4)	4 (4)	1 (2)	36 (10) *	9 (17) *	36 (7)	36 (7)	9 (8)
	Recommended treatment †	179 (29)	176 (32) *	3 (6)	125 (31)	54 (27)	25 (27)	29 (27)	8 (14)	117 (33) *	3 (6)	176 (32) *	151 (31)	28 (24)
	Not recommended	432 (71)	383 (69) *	49 (94)	285 (70)	147 (73)	67 (73)	80 (73)	48 (86)	237 (67) *	50 (94)	382 (69) *	342 (69)	90 (76)
Genital herpes	Identified herpes lesion	547 (90)	497 (89)	50 (96)	384 (94) *	163 (81)	72 (78)	91 (84)	52 (93)	332 (94) *	52 (98) *	495 (89)	457 (93) *	90 (76)
	Correct herpes treatment	289 (47)	247 (44)	42 (81) *	215(52) *	74 (37)	30 (33)	44 (40)	27 (48)	188(53) *	43 (81) *	246 (44)	241 (49)	48 (41)
Male UDS	Syndrome	564 (92)	518 (93)	46 (89)	384 (94)	180 (90)	81 (88)	99 (91)	51 (91)	333 (94)	48 (91)	516 (93)	458 (93)	106 (90)
	Syndrome causes	40 (7)	34 (6)	6 (12)	32 (8)	8 (4)	4 (4)	4 (4)	2 (4)	30 (9)	7 (13)	33 (6)	33 (7)	7 (6)
	Recommended treatment †	244 (40)	226 (40)	18 (35)	172 (42)	72 (36)	34 (37)	38 (35)	21 (38)	151 (43)	19 (36)	225 (40)	195 (40)	49 (42)
	Not recommended, not harmful	1 (.2)	1 (.2)	0 (0)	1 (.2)	0 (0)	0 (0)	0 (0)	0 (0)	1 (.3)	0 (0)	1 (.2)	1 (.2)	0 (0)
	Not recommended, potentially harmful	366 (60)	332 (59)	34 (65)	237 (58)	129 (64)	58 (63)	71 (65)	35 (63)	202 (57)	34 (64)	332 (60)	297 (60)	69 (59)
VDS	Syndrome	591 (97)	542 (97)	49 (94)	398 (97)	193 (96)	86 (94)	107 (98)	52 (93)	346 (98) *	50 (94)	541 (97)	475 (96)	116(98)
	Syndrome causes	54 (9)	42 (8)	12 (23) *	47 (12) *	7 (4)	3 (3)	4 (4)	4 (7)	43 (12) *	11 (21) *	43 (8)	44 (9)	10 (9)
	Recommended treatment †	35 (6)	32 (6)	3(6)	25 (6)	10 (5)	5 (5)	5 (5)	4 (7)	21 (6)	3 (6)	32 (6)	30 (6)	5 (4)
	Not recommended, not harmful	265 (43)	250 (45)	15 (29)	174 (42)	91 (45)	38 (41)	53 (49)	26 (46)	148 (42)	13 (25) *	252 (45)	216 (44)	49 (42)

Sex Transm Dis. Author manuscript; available in PMC 2019 September 23.

Correctly	Identified	Total (n = 611), n (%)	Type		Formal STI Training			STI/HIV Training			Profession		Location	
			Public (n = 559), n (%)	Private (n = 52), n (%)	Yes (n = 410), n (%)	No (n = 201), n (%)	Neither (n = 92), n (%)	HIV (n = 109), n (%)	STI (n = 56), n (%)	Both (n = 354), n (%)	MD (n = 53), n (%)	Nurse (n = 558), n (%)	Metro (n = 493), n (%)	Rural (n = 118), n (%)
	Not recommended, potentially harmful	311 (51)	277 (50)	34 (65)	211 (52)	100 (50)	49 (53)	51 (47)	26 (46)	185(52)	37 (70)	274 (49)*	247 (50)	64 (54)

Missing and don't know responses enumerated as an incorrect response.

*Statistically significant difference, $P \leq 0.05$.

†Recommended in National Guidelines (first or alternative treatment regimen).

TABLE 3.

Provider Attitudes About Patients

Agreed With	Total (n = 611), n (%)	Facility		Sex		Profession		Formal STI Training	
		Public (n = 559), n (%)	Private (n = 52), n (%)	Male (n = 67), n (%)	Female (n = 544), n (%)	Doctor (n = 53), n (%)	Nurse (n = 558), n (%)	Yes (n = 410), n (%)	No (n = 201), n (%)
Most patients do not want education or counseling about STIs	310 (51)	288 (52)	22 (42)	29 (43)	281 (52)	19 (36)*	291 (52)	200 (49)	110 (55)
I would prefer not to deal with STI patients	76 (12)	68 (12)	8 (15)	5 (8)	71 (13)	7 (13)	69 (12)	43 (11)*	33 (16)
I do not like examining male genitalia	128 (21)	118 (21)	10 (19)	5 (8)*	123 (23)	8 (15)	120 (22)	74 (18)*	54 (27)
Most male STI patients are unwilling to talk about their symptoms	342 (56)	320 (57)	22 (42)*	29 (43)*	313 (58)	24 (45)	318 (57)	225 (55)	117 (58)
Most male STI patients I see refuse to have a genital exam	286 (47)	276 (49)	10 (19)*	14 (21)*	272 (50)	12 (23)*	274 (49)	177 (43)*	109 (54)
Most male STI patients who have multiple sex partners are unwilling to use condoms consistently	474 (78)	434 (78)	40 (77)	48 (72)	426 (78)	40 (76)	434 (78)	317(77)	157 (78)
I do not feel it is appropriate to give male condoms to women with STIs	108 (18)	100 (18)	8 (15)	14 (21)	94 (17)	10 (19)	98 (18)	62 (15)*	46 (23)
Most female patients are unwilling to talk about their symptoms	195 (32)	182 (33)	13 (25)	16 (24)	179 (33)	11 (21)	184 (33)	129 (32)	66 (33)
Most female patients I see refuse to have a genital exam	111 (18)	103 (18)	8 (15)	18 (27)	93 (17)*	7 (13)	104 (19)	73 (18)	38 (19)
Most female patients I see are not willing to ask their partners to use a condom	359 (59)	333 (60)	26 (50)	28 (42)*	331 (61)	23 (43)*	336 (60)	228 (56)*	131 (65)
I do not feel it is appropriate to give condoms to adolescents who have STIs	100 (16)	88 (16)	12 (23)	11 (16)	89 (16)	10 (19)	90 (16)	57 (14)*	43 (21)
I think some STIs can be cured by traditional healers	116 (19)	105 (19)	11 (21)	16 (24)	100 (18)	10 (19)	106 (19)	73 (18)	43 (21)
Under certain circumstances it is OK to test patients for HIV without telling them	172 (28)	156 (28)	16 (31)	20 (30)	152 (28)	13 (25)	159 (29)	127 (31)	45 (22)*
In the long run, some HIV meds can be more dangerous than having AIDS	213 (35)	196 (35)	17 (33)	23 (34)	190 (35)	13 (25)	200 (36)	136 (33)	77 (38)
I think using condoms can decrease the chance of getting STIs	546 (89)	500 (89)	46 (89)	60 (90)	486 (89)	48 (91)	498 (89)	369 (90)	177 (88)
I think using condoms can decrease the chance of getting HIV	546 (89)	502 (90)	44 (85)	56 (84)	490 (90)	45 (85)	501 (90)	368 (90)	178 (89)
It is important to tell STI patients to make sure their sex partners are treated	563 (92)	514 (92)	49 (94)	63 (94)	500 (92)	49 (93)	514 (92)	382 (93)	181 (90)

Sex Transm Dis. Author manuscript; available in PMC 2019 September 23.

Agreed With	Total (n = 611), n (%)	Facility		Sex		Profession		Formal STI Training	
		Public (n = 559), n (%)	Private (n = 52), n (%)	Male (n = 67), n (%)	Female (n = 544), n (%)	Doctor (n = 53), n (%)	Nurse (n = 558), n (%)	Yes (n = 410), n (%)	No (n = 201), n (%)
I think one of my most important responsibilities is to strongly recommend HIV test to each of my STI patients	572 (94)	522 (93)	50 (96)	63 (94)	509 (94)	52 (98)	520 (93)	387 (94)	185 (92)
I am willing to perform a finger stick HIV test for my STI patients	567 (93)	521 (93)	46 (89)	61 (91)	506 (93)	47 (89)	520 (93)	383 (93)	184 (92)

Missing and don't know responses enumerated as an incorrect response.

*Statistically significant difference, $P \leq 0.05$.