SYNDROMIC MANAGEMENT TRAINING FOR NON-FORMAL CARE PROVIDERS IN PAKISTAN IMPROVES QUALITY OF CARE FOR SEXUALLY TRANSMITTED DISEASES STD CARE: A RANDOMIZED CLINICAL TRIAL

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Abstract. We conducted a randomized, controlled, three-armed trial to assess whether training in syndromic management, with provision of packets, could improve the quality of STD services provided among non-formal care providers. The quality of STD case management service, observed by "incognito patients" in both intervention groups, improved substantially compared to the control group ($p < 0.05$). The training-and-packets group performed better in service delivery, HIV-testing referral, and condom provision when compared to the training-only group (all $p < 0.05$). The training-and-packets group also retained more knowledge and practiced more skillfully at six months post-intervention when compared to the training-only group ($p < 0.05$). Exit interviews of clients suggested that 81% of providers in the intervention groups offered advice on condom use when compared to none of those in the control group ($p < 0.001$). Syndromic management training and free syndrome packets for non-formal providers had a positive impact on the quality of STD care among the trained providers.

INTRODUCTION

Risk behaviors associated with sexually transmitted diseases (STDs), including human immunodeficiency virus (HIV), are prevalent in Pakistan (Khan and Hyder, 2000). Syndromic management has been the cornerstone of STD control in many resource-limited settings (Wilkinson and Rutherford, 2001), yet it needs to be tailored to local needs and realities in both form and content (Mayaud et al, 1997; Tuladhar et al, 1998; Wilkinson et al, 1999; Harrison et al, 2000; Maher et al, 2003). In Pakistan, STD services are provided by specialists (dermato-venereologists, gynecologists, and urologists) whose services are accessible to only a small proportion of the general population living in urban areas. General practitioners who provide primary care services to about 90% of the population usually lack training, skills, and motivation to provide STD care (Khawaja et al, 1997; Muhammad et al, 1998). Many Pakistanis lack confidence in the formal health care system, especially in the public sector, due to understaffing and poor medication availability (Khan, 1995). In the non-formal health care sector, a large number of "sex-clinics" exist, both in urban and rural areas, that provide STD and sexual dysfunction services to an exclusively male clientele (Khan, 1995). The providers who run these clinics have no formal medical training and are

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referred as "quacks" by physicians. Nonetheless, sex-clinics are popular among customers seeking health care due to their affordability and for the privacy and attention they offer.

We conducted formative research that suggested that at least three-quarters of the general male population prefers to seek care from a non-formal private medical practitioner for routine illnesses (Khan, 1995). Improving the quality of "first encounter" STD care in the non-formal health care sector is one option for improving STD control and prevention in Pakistan (Shah *et al*, 1999). The World Health Organization (WHO) recommends the syndromic case management approach as the most appropriate and cost-effective strategy for case management of STDs in developing countries (Vuylsteke and Meheus, 2003). Several studies have demonstrated significant improvement in the management of STDs by providing training in syndrome management to health care workers from both formal and non-formal sectors (Wilkinson *et al*, 1999; Mayaud *et al*, 1997; Harim *et al*, 2000; Maher *et al*, 2003; Tuladhar *et al*, 1998). Syndromic packets that include syndrome-specific drugs (suitable for local gonorrhea resistance patterns), condoms, partner notification cards, and patient information leaflets have received positive responses from both STD-care providers and patients.

We assessed whether introducing training for syndromic case management to Pakistani sex-clinic practitioners, with or without the provision of STD syndromic packets, could enhance the quality of the care they provide to symptomatic men.

MATERIALS AND METHODS

We conducted a randomized, controlled, three-armed trial to evaluate the efficacy of syndromic management training and packet provision in Karachi, Hyderabad, and Sukkur, major cities in Sindh Province in southeast Pakistan. The study outcome was the quality of STD care, defined as (1) correct STD diagnosis using syndromic case management; (2) appropriate case management; (3) appropriate risk reduction counseling; (4) appropriate discussion on treatment adherence; (5) privacy during examination and consultation; (6) waiting time and duration of consultation; and (7) supportive, non-judgmental attitudes of the health care provider. Using a survey and clinic mapping technique, a comprehensive list of sex-clinic-based, non-formal health providers was developed in each city and used to randomly select 120 study participants, 60 providers (out of 310 identified, a 19.4% sample) from Karachi and 30 each from Hyderabad (out of 95, 31.6%) and Sukkur (out of 90, 33.3%). It is easy to identify these clinics as they are positioned to appeal to the public, claiming specialization in sexual disorders on Urdu-language sign boards in front of their clinics. The 120 providers were allocated randomly to three groups of 40 using Excel (Microsoft Corporation, Redmond, WA), with a replacement strategy to ensure balanced allocation by city. The two intervention groups underwent tailored training workshops in syndromic management of STDs; the "training only" group did not receive STD syndromic packets for distribution to patients, while the "training-and-packets" group received a 60 day supply of STD syndromic packets for all their patients coming for STD symptoms and/or signs. The control group only received basic written information about STD management. These practitioners were trained only after the completion of the study, and they did not receive syndromic management packets.

A two-day workshop was conducted by the Pakistan AIDS Prevention Society in collaboration with the Sindh AIDS Control Program in Karachi using a Pakistani version of the training modules and flow charts derived from the WHO guidelines for STD syndromic case management. Our modification inte-

grated the National/Provincial STD management guidelines of the Pakistani Ministry of Health. The training curriculum included: (1) STD etiology, transmission and control issues; (2) syndromic case management, including use of flow charts with diagnostic and treatment tips; (3) universal precautions during patient examinations; (4) treatment follow-up issues; (5) sexual health promotion, including behavioral risk reduction counseling and promotion of condoms; (6) contact tracing based on partner referral, partner management; (7) referral services available, especially for complex cases and for suspected HIV; (8) public health reporting for STDs, including forms; and (9) confidentiality issues.

Training consisted of four two-hour workshops held in close proximity to the sex-clinics, in the afternoon break-time of these clinics for four consecutive days. Adult learning methods were used for the training, with an emphasis on learning through videos, role-playing, group discussions, and short lectures.

The modified syndromic case management flow charts and training modules were field tested with 10 non-formal sex-clinic care providers to test their acceptability and practicality. The pre- and post-test survey instruments were also pre-tested before implementation.

In addition to the training, the "training-and-packets" intervention group (Fig 1) received free STD syndromic packets for six months. The number of packets provided varied according to number of patients seen by individual care provider, and consumed stock was replaced on weekly basis. The field assessment of each practitioner's need for packets was done by one of the investigators (SAS) to minimize wastage or profiteering. Some providers had packets left at the end of the study; these were not taken back, but were allowed to be used for future patients. Packets were prepared as suggested by Wilkinson *et al* (1999), and educational materials were adapted to Urdu. Typically, non-Urdu-speaking men bring a friend or relative for medical care who does speak Urdu, or they seek a practitioner who also speaks their language (*eg*, Pashto, Afghan, Baluchi, Sindhi). Syndromic packets included treatment drugs, condoms, partner notification cards, and patient informational leaflets. Packets were provided for the two most common conditions encountered in sex clinics for men: urethral discharge and genital ulcers. Urethral discharge packets included one ciprofloxacin tablet (500 mg), 14 doxycycline tablets (100 mg each), four male latex condoms, and the educational materials. Genital ulcer packets included 21 erythromycin tablets (500 mg each).

A referral network list of public sector STD clinics and HIV testing centers established by the Sindh AIDS Control Program was provided to all practitioners. All intervention group providers (*ie*, training-only group and training-and-packets group) received referral cards for referring their clients for HIV testing or treatment of STD complications or treatment failures, flow charts, HIV testing forms for referral to voluntary counseling and testing centers, condoms, and both professional and patient-oriented literature related to STDs and HIV/AIDS.

For control group practitioners, study investigators solicited their informed consent at their clinic sites, explained the study procedures, and provided basic written information about STD treatment flow charts and their use. Written information was also provided regarding locations to obtain condoms and medicines.

Assessment methods

We used three methods to assess the impact of the intervention. We administered pre- and post-training evaluations with a self-administered questionnaire to all intervention group practitioners. Pre-training assessed baseline knowledge and skills before interven-
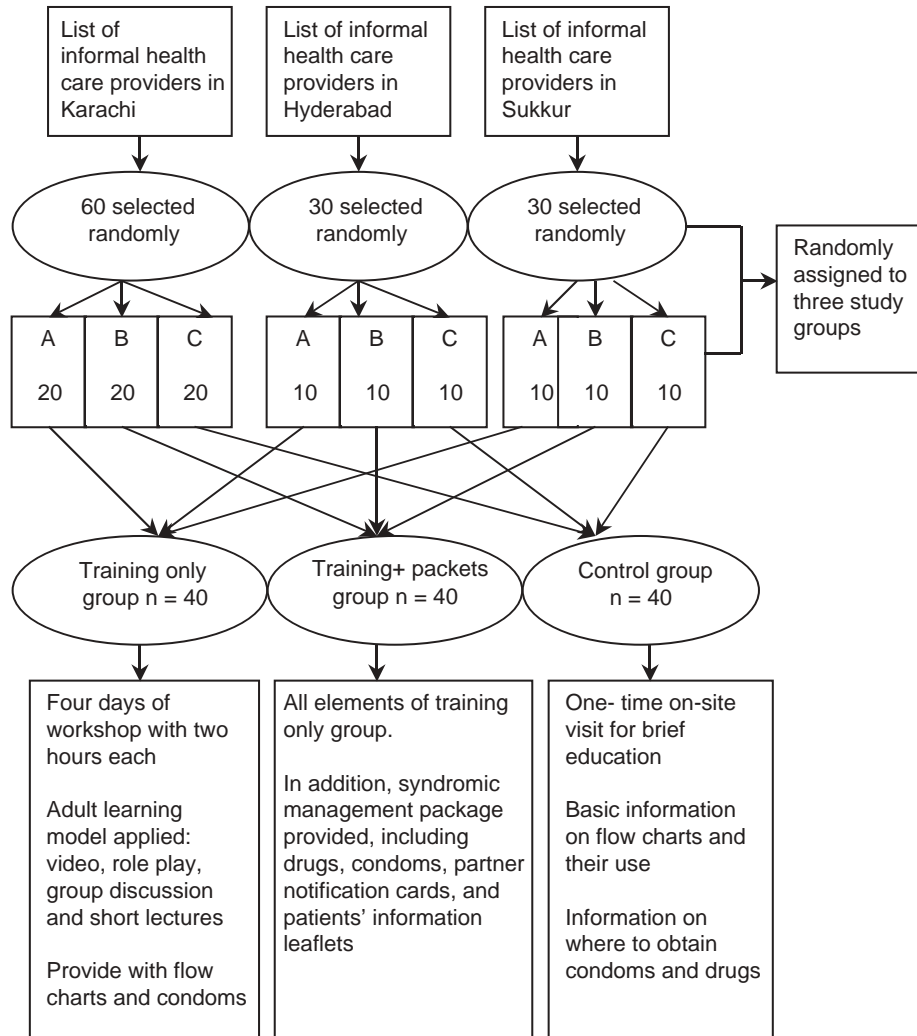
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┌─────────────┐   ┌─────────────┐   ┌─────────────┐
│ List of     │   │ List of     │   │ List of     │
│ informal    │   │ informal    │   │ informal    │
│ health care │   │ health care │   │ health care │
│ providers in│   │ providers in│   │ providers in│
│ Karachi     │   │ Hyderabad   │   │ Sukkur      │
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60 selected randomly   30 selected randomly   30 selected randomly

| A 20 | B 20 | C 20 |

| A 10 | B 10 | C 10 |

| A 10 | B 10 | C 10 |

Randomly assigned to three study groups

Training only group n = 40

Training+ packets group n = 40

Control group n = 40

Four days of workshop with two hours each

Adult learning model applied: video, role play, group discussion and short lectures

Provide with flow charts and condoms

All elements of training only group.

In addition, syndromic management package provided, including drugs, condoms, partner notification cards, and patients' information leaflets

One- time on-site visit for brief education

Basic information on flow charts and their use

Information on where to obtain condoms and drugs

Fig 1–Randomization scheme and interventions.

tion. The same questionnaire, administered six months later, assessed any knowledge and skills that were learned and retained. A similar questionnaire was applied to non-intervention practitioners, as a baseline, and to establish that the groups were indeed comparable in the dependent variables.

After consulting with the care provider, 10 actual clients visiting the sex clinics with STD symptoms (rather than sexual dysfunction) were randomly selected from 10 representative clinics. Providers did not assist in the se-lection of clients for exit interview because the clients were selected after leaving the clinics; however, the providers were informed that exit interviews were being conducted. After obtaining informed consent, the clients were administered an exit interview questionnaire that detailed: current symptoms; diagnosis received; time spent with the care providers; treatment received; whether they received condoms, STD literature, and/or risk reduction counseling; whether they were advised to refer their sex partners and/or received refer-

ral for HIV testing; and quality of the STD services received. Exit interviews were also conducted with clients who had been seen just before the interview at the end of the six-month intervention period.

The third evaluation strategy was based on direct observations by a team of one investigator and one "incognito patient." The team visited all 120 clinics to assess the quality of services provided to the clients (investigator observations) or to the putative STD patients ("incognito patient" observations). While they functioned as a team, the investigator and "incognito patient" visited each clinic at different times, such that the incognito patient assessed how he was received, interviewed, counseled, and treated; and the investigator focused on process indicators, such as the presence of referral forms in the clinic and the presence of an adequate supply of STD syndromic packets. The incognito patients were used because we believed that informal care practitioners would improve the quality of their care at a time they knew that they were being observed by doctors.

The principal objective of the incognito patient visit was to assess if practitioners followed key procedures included in the STD syndromic case management training: (1) adequate history taking, privacy protection; (2) clinical examination of an undressed (or partially undressed) patient; (3) counseling for risk reduction; (4) referral for an HIV test; and (5) appropriate management given the negative physical examination in the incognito patient. Half of incognito patient visits reported symptoms suggestive of a urethral discharge while half suggested a genital ulcer; no incognito patient had signs of either syndrome. Data were integrated from incognito patients and investigators after both had visited a given clinic.

The main outcome measures for the study consisted of indicators of the quality of case management, which were derived from

recommended standards (Vuylsteke *et al*, 2003): (1) correct diagnosis using syndromic case management flow charts; (2) appropriate case management (correct drug use, condoms provided, partner notification card); (3) appropriate counseling on the avoidance of sex during the illness and the use of a condom if they do have sex, the risk of their sex partner(s) being infected, the importance of referring their partner(s), the importance of adherence to recommended treatment; (4) privacy during examination and consultation; (5) waiting time and duration of consultation; and (6) supportive, non-judgmental attitudes of the health care provider.

Data analysis

All data were entered using EPI-INFO (CDC, Atlanta, GA) and were analyzed with SAS 9.0 (SAS, Inc, Cary, NC). The combined intervention groups were compared to the control group, and the "training only" group was compared to the "training-and-packets" group. Chi-square and Student's *t*-test were used to assess statistical significance, without correction for multiple comparisons. Exit interviews of real patients were analyzed qualitatively regarding the subjective impressions and reports of the patients. Pre- and post-test data were collected only from the two intervention groups.

RESULTS

Six months post-intervention, care providers who received training reported benefits of the training for their practice and care giving (Table 1). Care providers often continued to use syndromic case management protocols in their practices, including advising their clients about partner referral, condom education, and HIV testing. The direct observations from our professional evaluators suggested that 82% of the 71 incognito patients for the two intervention groups were diagnosed as the professional observers would have done,

Table 1
Self-assessment of knowledge, skills, and satisfaction with training for practitioners in the two intervention groups six month post-training.

Knowledge, skills and satisfaction	Overall (n 80)	Training and packets group (n = 40)	Training only group (n = 40)
Rating of the training received in STD management			
Skills improved greatly	68	32(80%)	36(90%)
Skills improved to some extent or no benefit	12	8	4
Currently treat STD patients based on training			
Yes	74	35(88%)	39(98%)
No, practitioner is unconvinced or reports clients' dislike	6	5	1
Services now provided to clients with symptoms/signs			
Treatment, education, and prevention counseling	59	29(73%)	30(75%)
Treatment and limited education	10	6	4
Treatment only	11	5	6
Conduct of clinical examinations			
Every clients	65	30(75%)	35(88%)
Some or no clients	15	10	5
Promote and/or provide condoms			
Yes	74	35(87.5%)	39(98%)
No	6	5	1
Refer STD patients for HIV testing			
Always	63	28(70%)[a]	35(87.5%)
Sometimes or never	17	12	5
Refer sex partner for treatment			
Always	63	28(70%)[a]	35(87.5%)
Sometimes or never	17	12	5
Correct knowledge of causes of genital ulcers			
Yes, syphilis, chancroid, herpes simplex type 2	71	32(80%)[a]	39(97.5%)
No. incorrect knowledge	9	8	1
Treatment of genital ulcer			
Penicillin injection and oral trimethoprim/sulfamethoxazone	72	34(85%)	38(95%)
Incorrect antibiotics or their own herbal medicines	8	6	2
Treatment of urethral discharge			
Oral ciprofloxacin and doxycycline	66	31(78%)	35(88%)
Incorrect antibiotics or their own herbal medicines	14	9	5

based on symptoms and key signs per the appropriate flow-chart, compared to none of the control group of incognito patients (p < 0.001; Table 2).

A non-statistically significant trend suggested that the providers in both intervention groups were performing better in their service delivery than their counterparts in the control group (Table 3). The sample size was only 10 per group.

The quality of STD case management services observed by incognito patients in both intervention groups improved substantially for all seven items related to the quality of the STD case management services compared to control group practitioners (p < 0.05; Table 4). Providers from both intervention groups paid more attention to privacy than

Table 2
Key features of observed intervention and control clinics.

	Training only group (n=34)	Training and packets group (n=37)	Control group (n=15)
Interruption in patient encounter	N (%)	N (%)	N (%)
Yes	3 (9)	3 (8)	1 (7)
No	30 (91)	34 (92)	14 (93)
Waiting period			
≤15 minutes	19 (56)	7 (19.4)[a]	10 (66.7)
>15 minutes	15 (44)	29 (80.6)	5 (33.3)
Average waiting time	14.4 (±4.6)	19.0 (±7.2)	13.8 (±6.9)
Treatment Time			
≤15 minutes	9 (26.5)	4 (10.8)[a]	6 (40)
>15 minutes	25 (73.5)	33 (89.2)	9 (60)
Average treatment time in minute ± SD	21.2 (±7.8)	19.8 (±7.8)	7.5 (±27.5)
Syndromic packets distributed			
Yes	0 (0)	30 (81.1)[a]	0 (0)
No	34 (100)	15 (100)	7 (18.9)
Flow charts posted			
Yes	32 (94.1)[a]	37 (100)[a]	0 (0)
No	2 (5.9)	0 (0)	15 (100)
Guidelines followed			
Yes	28 (82.4)[a]	30 (81.1)[a]	0 (0)
No	6 (17.6)	7 (18.9)	15 (100)
HIV testing referrals made			
Yes	24 (70.6)[a]	35 (94.6)[a,b]	0 (0)
No	10 (29.4)	2 (5.4)	15 (100)
Client record forms used			
Yes	20 (58.8)[a]	21 (56.8)[a]	2 (13.3)
No	14 (41.2)	16 (43.2)	13 (86.7)
Condom use discussed			
Yes	24 (70.6)[a]	34 (91.9)[a,b]	0
No	10 (29.4)	3 (8.1)	15 (100)
STD literature given			
Yes	16 (47.1)[a]	31 (83.8)[a,b]	0 (0)
No	18 (52.9)	6 (16.2)	15 (100)

[a] = $p < 0.05$ when compared to control group; [b] = $p<0.05$ when compared to intervention I group.
P-values were calculated based on chi-square test or the Fisher's exact test as appropriate.
Only clinics that reached acceptable standards of privacy and cleanliness at baseline were included to ensure comparability.

those from the control group. The longest waiting time was noted in the "training-and-packets" group, and the shortest waiting time was noted in the control group ($p < 0.05$). The considerable time spent with incognito patients in the intervention groups was notable when compared to the control group (Table 4).

The "training-and-packets" providers performed better in syndromic packet delivery, as expected, but were also best in HIV testing referral, condom provision, and STD literature availability ($p <0.05$ for all comparisons between the two intervention groups, data not shown). We observed a notable failure in the

Table 3
Exit interview of 10 STD clients from all three clinic types (training only; training with syndromic packets; control group receiving information only).

	Training only group (N=10)	Training and packets group (N=10)	Control group (N=10)
Correctly diagnosed the condition according to syndromic protocol	9 (90%)[a]	9 (90%)[a]	0 (0%)
Time spent with patients			
20-29 minutes	0	0	2
30-44	7	9	5
≥ 45 or more	3	1	3
Clients' views of care providers			
Friendly	10 (100%)	10 (100%)	10 (100%)
Quick decision maker	0 (0%)	0 (0%)	0 (0%)
Caring	10 (100%)	10 (100%)	10 (100%)
Provide easy words to make conversation easy	10 (100%)	10 (100%)	7 (70%)
Use simple words in conversation	10 (100%)	10 (100%)	7 (70%)
Provide concentration	10 (100%)	10 (100%)	8 (80%)
Good listener	10 (100%)	10 (100%)	8 (80%)
Removed hesitation	10 (100%)	10 (100%)	7 (70%)
Provide privacy while taking history	10 (10%)	10 (10%)	9 (90%)
Provide privacy while examining	8 (80%)	8 (80%)	4 (40%)
Clinically examined?	8 (80%)[a]	8 (80%)[a]	2 (20%)
Comfort checkup?	8 (100%)[a]	8 (100%)[a]	2 (100%)
Professionally check up	8 (100%)[a]	8 (100%)[a]	2 (100%)
Counseling provided?	8 (80%)	10 (100%)[a]	4 (40%)
Packets provided?	1 (10%)	6 (60%)[b]	0 (0%)
Instruction provided on how to use dosage?	10 (100%)	10 (100%)	10 (100%)
Instruction on how to use condom?	8 (80%)[a]	8 (80%)[a]	0 (0%)
Demonstrate how to use condom?	8 (80%)[a]	8 (80%)[a]	0 (0%)
Suggest stop sexual contact temporary?	8 (80%)	8 (80%)	5 (50%)
Suggest come again after using dosage?	10 (100%)	9 (90%)	9 (90%)
Did you say about to change habits?	8 (80%)[a]	7 (70%)	3 (30%)
Suggest reduce number of sex partners?	8 (80%)[a]	7 (70%)[a]	2 (20%)
Suggest reduce number of some specific type of sex partner?	8 (80%)[a]	7 (70%)[a]	2 (20%)

[a]indicate p<0.05 when compared to control group; [b]indicate p<0.05 when compared to intervention I group. P-values were calculated based on chi-square test or the Fisher's exact test as appropriate.

randomization process in that clinics with poor privacy and cleanliness were far more likely to have been represented in the control group (9 of 80 in the intervention groups versus 25 of 40 in the control group, p < 0.0001). In the subgroup analysis in which we only compared those clinics that had reasonable privacy and cleanliness standards at baseline, results similar to the full analysis were observed (Table 2).

DISCUSSION

Given the usual poor standard of care (untrained practitioners fail to conduct a proper

Table 4
Features observed by incognito patients in the three clinic types at six months post training intervention, or information distribution.

	Training only group (N=40)	Training and packets group (N=40)	Control group (N=40)
Privacy at reasonable level			
Yes	38 (95)	40 (100)[a]	34 (85)
No	2 (5)	0 (0)	6 (15)
Cleanliness acceptable			
Yes	35 (87.5)[a]	37 (92.5)[a]	16 (40)
No	4 (12.5)	2 (7.5)	24 (60)
Interruption in patient encounter			
Yes	4 (10.3)	3 (7.5)	9 (22.5)
No	35 (89.7)	37 (82.5)	31 (77.5)
Waiting period			
≤15 minutes	22 (55)	8 (21)	33 (83)
>15 minutes	18 (45)	31 (80)	7 (7.5)
Average waiting time in minute ± SD	14.5 (±4.6)[a]	11.6 (±6.2)	18.7 (±7.1)[a,b]
Treatment time			
≤15 minutes	13 (33)	5 (13)	17 (43)
> 15 minutes	27 (68)	35 (88)	23 (58)
Average waiting time in minute ± SD	20.5 (±8.0)	24.8 (±6.0)[a]	20.1 (±7.8)
Syndromic packets distributed			
Yes	0	31 (78)[a,b]	0
No	40 9(23)	40	
Flow charts posted			
Yes	37 (93)[a]	39[a] (98)	1 (2.5)
No	3 (7.5)	1 (2.5)	39 (97.5)
Guidelines followed			
Yes	31 (78)[a]	32 (80)[a]	0(0)
No	9 (23)	8 (20)	40 (100)
HIV testing referrals made			
Yes	26 (65)[a]	38 (95)[a,b]	0
No	14 (35)	2 (5)	40 (100)
Clients record forms used			
Yes	22 (55)[a]	21 (53)[a]	2 (5)
No	18 (45)	19 (48)	38 (95)
Condom use discussed			
Yes	28 (70)[a]	37 (93)[a,b]	0
No	12 (30)	3 (7.5)	40 (100)
STD literature given			
Yes	18 (45)[a]	32 (80)[a,b]	0
No	22 (55)	8 (20)	40 (100)

[a]indicate $p < 0.05$ when compared to control group; [b]indicate $p < 0.05$ when compared to intervention I group. P-values were calculated based on chi-square test or the Fisher's exact test as appropriate.

genital examination, confuse STD symptoms with sexual dysfunction symptoms, and do not provide risk reduction counseling), positive outcomes were easy to identify. The evaluation data suggested that non-formal practitioners can be trained to be effective allied health workers for STD care. Easily accessible, affordable, acceptable, and effective STD management services are essential for countries like Pakistan that face a nascent HIV/AIDS epidemic (Shah *et al*, 1999). Utilization of the syndromic management protocol offers immense potential for serving thousands of clients and providing quality STD services (Wilkinson *et al*, 2001). In a context of mistrust and lack of confidence in formal health care systems, non-formal/traditional healers continue to be a major means of health care provision for a large proportion of the population in Pakistan and other developing countries. However, formal care providers mistrust "quacks" and do not engage them in mainstream clinical care. Perhaps our findings can reduce this mistrust and foster the targeting of these informal providers for training in syndromic management protocols, including packet provision (Khan, 1995).

Our documentation of the benefits of a training program to improve the knowledge, skills, and practices of non-formal STD care providers in three cities in Pakistan corroborates the findings of studies elsewhere (Wilkinson *et al*, 1999; Mayaud *et al*, 1997; Harim *et al*, 2000; Maher *et al*, 2003; Tuladhar *et al*, 1998). The syndromic case management approach should be extended into the non-formal sector in any region of the world where such practitioners provide STD care for men. Such practitioners are often popular with men, regardless of the quality of services received, because informal providers attend to patients for relatively long consultations, while doctors in the formal care setting may spend just a few minutes with a given patient. We are confident that this significant sex clinic industry will continue, despite the disapproval from the medical profession.

Training methods developed for the formal sector health care providers can be adapted for the non-formal, traditional health care system. Sustaining STD syndromic packet distribution is more problematic. We were unsuccessful in coaxing the provincial government to support this program after the study was completed, despite our promising results. A valuable adjunct of our training program was a beginning in bridging the gap between non-formal care providers and the traditional health care system. The referral network that was established for HIV testing between non-formal sector and traditional health care providers has led to an increase in HIV testing referrals from the sex clinics, something that was virtually unknown prior to our study (SAS, personal observations). The study itself seems to have improved contact between the investigators (SAS and MAM) who were running VCT centers associated with the Sindh AIDS Control Programme and the informal care providers. Since the investigators were providing literature, syndromic packets (to the training and packets group), feedback on referrals for HIV testing, and advice on effective HIV/STD prevention and control, new interactions were established between doctors and non-formal providers. Non-formal providers who received training in syndromic management adopted, not only diagnostic protocols and flowchart-based treatment guidelines, but also were more likely to provide counseling for risk reduction, partner referral, and HIV testing (The Voluntary HIV-1 Counseling and Testing Efficacy Study Group, 2000).

One of the major strengths of the study was that our results were not restricted to observations from a specific health care facility so that our findings were unlikely to have been influenced by selection or referral biases. Limitations of our work are also evident. Self-reports from non-formal providers are subject

to social desirability bias, as are interviews with real patients. We believe that this may have been operative in our study because our results suggested that our interventions were far more successful than we believe would have been probable. Our work needs replication, both in Pakistan and in similar settings. We failed to validate the use of syndromic packets by matching stock with patient reports, relying instead on our three mechanisms of assessment. We were unsuccessful in sustaining our program after the end of the study, and we cannot comment as to longer-term sustainability of the favorable outcomes observed. Formal cost-effectiveness analyses to supplement the efficacy findings would be an advisable component of future work. We did not succeed in balancing baseline clinic characteristics on two key variables: clinic cleanliness and protection of patient privacy. Therefore, we needed to do subgroup analyses, comparing like-with-like, to ensure that our findings did not merely represent non-comparability of the randomized groups. Nonetheless, our study demonstrated that the non-formal care sector can be engaged to enhance the quality of the STD treatment and control services that they provide.

Given the global shortage of trained STD providers, the use of ancillary personnel is deemed essential for health care in the world's more resource-limited settings (Hojer, 1999). We suggest adding non-formal providers of STD services to men, practitioners who are very prevalent in south Asia and elsewhere in developing nations, to the list of traditional practitioners that we engage in primary care service delivery.

ACKNOWLEDGEMENTS

REFERENCES

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: 2769-79.

Hojer B. The community-health services interface: the critical issue for AIDS prevention. In: Caldwell J, *et al*, eds. Resistances to behavioural change to reduce HIV/AIDS infection in predominantly heterosexual epidemics in Third World countries. Canberra: Australian National University, 1999.

Khan OA, Hyder AA. Responses to an emerging threat: HIV/AIDS policy in Pakistan. *Health Policy Plan* 2001; 16: 214-8.

Khan TM. Country watch: Pakistan. *AIDS STD Health Promot Exch* 1995; 4: 7-8.

Shah SA, Khan OA, Kristensen S, Vermund SH. STD care providers and patients in the non-formal health sector in Karachi, Pakistan. [Abstract]. Denver, CO: ISSTDR, 11-14 July 1999; (abstract no. 310).

Khawaja ZA, Gibney L, Ahmed AJ, Vermund SH. HIV/AIDS and its risk factors in Pakistan. *AIDS* 1997; 11: 843-8.

Maher JE, Peterman TA, Osewe PL, Odusanya S,

Scerba JR. Evaluation of a community-based organization's intervention to reduce the incidence of sexually transmitted diseases: a randomized, controlled trial. *South Med J* 2003; 96: 248-53.

Mayaud P, Mosha F, Todd J, *et al*. Improved treatment services significantly reduce the prevalence of sexually transmitted diseases in rural Tanzania: results of a randomized controlled trial. *AIDS* 1997; 11: 1873-80.

Muhammad R, Soomro M, Mujeeb SA, Agha J, Shoaib M. Pattern of sexually transmitted diseases at a referral center of Karachi. [Abstract]. International Conference on AIDS 1998; 12: 1043.

The Voluntary HIV-1 Counseling and Testing Efficacy Study Group. Efficacy of voluntary HIV-1 counseling and testing in individuals and couples in Kenya, Tanzania, and Trinidad: a randomised trial. *Lancet* 2000; 356: 103-12.

Tuladhar SM, Mills S, Acharya S, Pradhan M, Pollock J, Dallabetta G. The role of pharmacists in HIV/STD prevention: evaluation of an STD syndromic management intervention in Nepal. *AIDS* 1998; 12 (suppl 2): S81-7.

Wilkinson D, Harrison A, Karim SA. STD syndrome packets: improving syndromic management of sexually transmitted disease in developing countries. *Sex Transm Dis* 1999; 26: 152-6.

Wilkinson D, Rutherford G. Population-based interventions for reducing sexually transmitted infections, including HIV infection. *Cochrane Database Syst Rev* 2001; (2): CD001220.

Vuylsteke B, Meheus A. Case management of STDs. In: Dallabetta G, Laga M, Lamptey P, eds. Control of sexually transmitted diseases, section II. Research Triangle Park, NC: Family Health International, 2003: 149-68.