

Knowledge and Skills for Management of Sexually Transmitted Infections by Rural Medical Practitioners in Bangladesh

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Abstract

Sexually transmitted infection (STI) management is considered rudimentary among rural medical practitioners (RMPs) in Bangladesh. We sought to understand the level of knowledge and skills in STI management and to assess the impact of a two-day training orientation among RMPs in Tangail district. Data were collected through a baseline survey of 225 practicing RMPs in the study area and a three-month follow-up survey of 99 RMPs who participated in a two-day STI/HIV orientation training. The level of formal training among RMPs ranged from none (22.7%), to paramedical training (14.7%) and local medical assistant training (62.6%). The baseline survey revealed a low level of STI/HIV knowledge and misconceptions about the transmission of STI/HIV among RMPs. RMPs mostly prescribed first line antibiotics for treatment of common reproductive tract infections (RTIs) including STIs, but they rarely prescribed the correct dosages according to the national RTI/STI management guidelines. Only 3% of RMPs were able to correctly answer all four HIV transmission (unprotected sexual intercourse, blood transfusion, needle sharing and mother to child transmission) questions at baseline, while 94.9% of RMPs answered all four correctly at three months following the training ($p = 0.001$). Only 10% of RMPs reported suggesting the recommended drug (azithromycin) and only 2% mentioned about the recommended dosage (2 gm single dose) for the treatment of urethritis/cervicitis; compared to 49.5% suggested azithromycin at follow-up with 39.4% mentioned the recommended 2 gm single dose ($p = 0.001$). Our study found low level of knowledge and poor practices related RTI/STI management among RMPs. Short orientation training and education intervention shown promise to increase knowledge and management skills for RTIs/STIs.

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Keywords

Rural Medical Practitioners, STI Management, Bangladesh, HIV Knowledge, Informal Health Providers

1. Introduction

Bangladesh is considered a low HIV prevalence country, it is vulnerable to epidemic because of its close proximity to Asian HIV epicentres and the presence of several high risk subgroups in the country [1]-[6]. The prevalence rates of curable sexually transmitted infections (STIs) among sex workers and other high risk groups in Bangladesh are high and consistent condom use in commercial sex is low [7] [8]. Effective STI management approaches along with other HIV/AIDS prevention efforts could play an important role in averting HIV/AIDS epidemic in Bangladesh. Because of the synergy and interrelationship in mode of transmission of STIs with HIV/AIDS, STI management is considered one of the proven tools in reducing HIV transmission in a population with a nascent epidemic [9]-[13].

Over 70% of Bangladesh's total population resides in rural areas with little access to formal health care. Only 2.5 qualified physicians are available per 10,000 populations, one of the lowest coverage rates in Asia [14]. The overwhelming majority of the rural population in Bangladesh seek medical care from rural medical practitioners (RMPs) also called "palli chikishok" or "grammo dakter", who use modern medicine but most of these practitioners were informally trained or self-trained without any formal medical education [15] [16]. Though RMPs are often the only medical care providers for most of Bangladesh's rural poor, there are no formal efforts to train them in disease management, including STIs, nor are there government regulations to monitor the quality of their practices [2]. RMPs are often not familiar with proper dosages of various medications and their potential side effects. One study indicated that RTIs were not well understood among village practitioners; they did not perform examination of their patients, used substandard dosage of drugs, and made no attempt to notify or treat sexual partners [17].

We conducted this study to assess level of knowledge and skills of RMPs in STI management, as well as to understand the impact of STI/HIV orientation training on several outcomes: RMPs abilities to comprehend STI syndromic guidelines and HIV transmission routes, to deliver better quality services, and to refer patients to certified physicians when appropriate.

2. Materials and Methods

The study was conducted between July 2002 and June 2003 in the Sadar thana (sub-district) of the Tangail district of Bangladesh among rural medical practitioners identified through a census in the study area. RMPs practice allopathic medicine for patient management, but they are not qualified medical graduates. Homeopaths and those who practice traditional or herbal medicines were not included in the study.

A baseline survey was conducted to collect information on socio-economic status, STI/HIV/AIDS related knowledge and skills, and STI patient care practices among the RMPs. Trained interviewers conducted personal interviews either at the RMPs' homes or their practices in the village markets, using a pre-tested structured questionnaire. An informed consent was obtained from each participating RMP. The protocol was reviewed and approved by the Institutional Review Board at the University of Alabama at Birmingham and locally by the Bangladesh Women's Health Coalition. A subgroup of the RMPs was invited to participate in a two-day STI/ HIV/AIDS training session. Participants were selected using a priority scale based on: 1) higher average number of patients encounter per day; 2) higher average number of STI patients encounters in last month of interview; and 3) a longer duration of practice as a RMP. To allow for more interactive sessions, the RMPs were divided into four groups of 33 trainees. Trainers included medical doctors and public health experts with years of experience in clinical management of STIs and public health research. The training curriculum included brief discussion human reproductive systems, STI/HIV/AIDS, etiology and symptoms of common of STIs, overview of STI syndromic management approaches, importance of patient referral and other prevention approaches. Each participant received printed materials on STI/HIV/AIDS, national STI syndromic management guidelines, a list of possible referral sites for STI patients, and a book of 100 referral forms. A simple referral form was developed

with two parts to record information on patient's name, age, key symptoms, and address of where being referred. Patients took one part with them to the providers being referred to, and RMP kept another part for their record. Three months following the training sessions, participating RMPs were re-interviewed with the same questionnaires as that used during the baseline survey. The follow-up survey was conducted to estimate the impact of training, focusing on knowledge and practices that RMPs could implement in their daily practice in STI management that was sustained three months following the training.

Data analysis: The data analysis was performed using SPSS[®] 17 version [18]. Chi-square and Fisher's exact test were used to compare categorical variables, and the non-parametric median test was used to compare continuous variables. Wilcoxon's matched pair test and McNemar's Chi-square test were performed when compared pre- and post-training status of selected variables on knowledge and practice. All *p*-values quoted are two sided, with a *p*-value < 0.05 considered as significant.

3. Results

A total of 225 RMPs participated in the baseline survey, 91.8% of the 245 of those originally identified in the census, rest 20 RMPs either refused to participate or could not be reached for baseline survey with several attempts. A majority of the practicing RMPs were married (90.7%) and men (98.7%). Most (83.6%) were Muslim, 16.4% were Hindu and nearly half (44.9%) were between the age of 30 - 44 years (Table 1).

Formal training and STD knowledge: Among the RMPs, only 45.3% had a secondary or higher level of education, however, all of them were literate. The level of training prior practicing allopathic medicine ranged from no training reported by 22.7% of the RMPs, paramedical training reported by 14.7% (three years paramedical training mainly provided in government institutes), and local medical assistant (LMA) training (four to six months training mainly offered by the private institutions) reported by 62.6% of the RMPs. Only 15.5% of the

Table 1. Socio demographic characteristics of rural medical practitioners by level of knowledge.

Characteristics N (%)	Baseline knowledge of ≤ 2 STI (n = 190)	Baseline knowledge of > 2 STI (n = 35)	Total number (n = 225)
Sex			
Male	189 (99.5)	33 (94.3)	222 (98.7)
Female	1 (0.5)	2 (5.7)	3 (1.3)
Age*			
≤ 29 years	49 (25.8)	16 (45.7)	65 (28.9)
30 - 44 years	87 (45.8)	14 (40.0)	101 (44.9)
≥ 45	54 (28.4)	5 (14.3)	59 (26.2)
Marital status			
Unmarried	15 (7.9)	6 (17.1)	21 (9.3)
Married	175 (92.1)	29 (82.9)	204 (90.7)
Religion			
Muslim	159 (83.7)	29 (82.9)	188 (83.6)
Hindu	31 (16.3)	6 (17.1)	37 (16.4)
Education			
Illiterate	-	-	0
Up to secondary level	87 (45.7)	15 (42.9)	102 (44.9)
Higher secondary	66 (34.8)	16 (45.7)	82 (36.4)
$>$ Higher secondary level	37 (19.5)	4 (11.4)	41 (18.2)
Training*			
No formal training	48 (25.3)	3 (8.6)	51 (22.7)
Paramedical	25 (13.1)	8 (22.9)	33 (14.7)
Local medical assistant	117 (61.6)	24 (68.5)	141 (62.6)
Times as a practitioner			
≤ 3 years	56 (29.5)	15 (42.9)	71 (31.6)
3 - 10 years	68 (35.8)	10 (28.6)	78 (34.7)
> 10 years	66 (34.7)	10 (28.6)	76 (33.8)

*Significant difference among groups (Pearson Chi 6.53, *p* < 0.03 and Fisher's Chi 6.10, *p* < 0.04 respectively).

RMPs were able to correctly name three out of four common STDs (syphilis, gonorrhoea, trichomoniasis, and HIV/AIDS) and their symptoms; none were able to identify all four. There was significantly higher knowledge of STIs among those who had paramedical training and were <30 years old compared to those who had no such training and were ≥30 years old.

STD treatment practices: Most of the practitioners diagnose STIs through taking history of symptoms and/or exposure to high risk behaviours (65.4% for male patients and 84.0% for female patients), while a few use laboratory investigations (35.6% for male patients and 16% for female patients) (**Table 2**). The participated RMPs commonly sell medications to their patients (90.7%) without written prescription (80.0%). A significantly higher proportion of RMPs with paramedical training depended on laboratory investigations for STI diagnosis and they were more likely to give prescriptions to their patients and less likely to sell medications as compared to their non-paramedical counterparts.

More than half (51.5%) of the RMPs reported that they prescribed ciprofloxacin for the treatment of gonorrhoea, but among them, only 3% prescribed the recommended 500 mg single dose. Similarly, only about a third of the RMPs reported to prescribed benzathene penicillin for the treatment of syphilis, among which only 4% prescribed the correct dose of 2.4 million units IM. While a great majority (83.8%) of RMPs suggested metronidazole for the treatment of vaginal discharge symptoms, only 4% of the RMPs used the recommended 2 gm single dose.

Role of training program: The proportion of RMPs that correctly named three out of four STDs (syphilis, gonorrhoea, trichomoniasis, and AIDS) increased from 19.2% to 36.3% following the training ($p = 0.014$, **Table 3**). Knowledge about transmission of STI/HIV significantly increased among RMPs following the training. Only 3% of RMPs were able to answer four out of four HIV transmission (unprotected sexual intercourse, blood transfusion, needle sharing and infected mother to child) questions correctly at baseline, while 94.9% of RMPs answered all four questions correctly following the training ($p = 0.001$). While misconceptions about HIV transmission were still apparent among the trained RMPs, 67.7% of the RMPs reported at least one misconception at

Table 2. Treatment practices and referral by type of professional training at baseline assessment.

Characteristics N (%) unless otherwise specified	Professional training			Total (n = 225)	p value
	No training (n = 51)	Local medical assistant (n = 141)	Paramedical training (n = 33)		
Patients/Day (mean ± SD)	15.8 ± 11.6	16.7 ± 13.6	14.5 ± 12.3	16.2 ± 12.1	
STD patients in last month (Mean ± SD)	7.7 ± 19.5	5.2 ± 14.6	4.2 ± 6.4	5.6 ± 15.0	
How diagnose STDs in men					
History only	21 (41.2)	44 (31.2)	5 (15.2)	70 (31.1)	0.004
History and physical exam	13 (25.5)	54 (38.3)	7 (21.2)	74 (32.9)	
History, physical and laboratory tests	17 (33.3)	43 (30.6)	21 (63.6)	81 (36.0)	
Paper prescription to patients					
Always	5 (9.8)	11 (7.8)	8 (24.2)	24 (10.7)	0.016
Some times	30 (58.9)	103 (73.1)	22 (66.6)	155 (68.9)	
Never	16 (31.4)	27 (19.1)	3 (9.1)	46 (20.4)	
Sell medicine					
Yes	48 (94.1)	135 (95.7)	21 (63.6)	204 (90.7)	<0.001
No	3 (5.9)	6 (4.3)	12 (36.4)	21 (9.3)	
Amount of patient fee					
No fee	45 (88.2)	120 (85.1)	20 (60.6)	185 (82.2)	0.013
10 - 25 taka	3 (5.9)	12 (8.5)	9 (27.3)	24 (10.7)	
26 - 50 taka	3 (5.9)	9 (6.4)	4 (12.1)	16 (7.1)	
Patients referred to next level care in last month (mean ± SD)	6.8 ± 7.3	6.48 ± 11.0	8.3 ± 17.8	6.8 ± 11.5	

Note: FET is Fisher's exact test.

Table 3. Changes in knowledge and practices of the rural medical practitioners who participated in training sessions (n = 99).

Variables	Baseline (%) (n = 99)	Follow up (%) (n = 99)	p value*
Named correct STIs			
One	99.0	100	
Two	92.9	85.8	
Three	19.2	36.3	0.014*
Four	0	14.1	
Named correct method of STI/HIV transmission			
One	67.7	100	
Two	32.3	100	
Three	12.1	100	<0.0001*
Four	3.0	94.9	
Misconception about HIV transmission			
One	67.7	30.3	
Two	19.2	10.1	
Three	8.1	6.1	<0.0001*
Ciprofloxacin for gonorrhea treatment			
Reported as drug of choice	51.5	47.5	0.8**
Reported correct dosages	3.0	5.2	0.7**
Azithromycin for gonorrhea treatment			
Reported as drug of choice	10.1	49.5	<0.0001**
Reported correct dosages	2.0	39.4	<0.0001**
Benzathine penicillin for syphilis treatment			
Reported as drug of choice	52.5	53.5	0.9**
Reported correct dosages	4.0	16.1	0.004**
Metronidazole for vaginal discharge treatment			
Reported as drug of choice	83.8	88.8	0.36**
Reported correct dosages	4.0	10.1	0.11**
Knowledge of drug resistance as a cause of antibiotic failure			
	28.3	41.4	0.03**

*Wilcoxon signed-rank test; **McNemar test.

baseline while only 30.4% did so at follow up ($p = 0.001$).

STI management practices: The most significant changes were observed in increased recommendation to use azithromycin for the treatment of urethral discharge (gonorrhea) syndrome. Only 10% of RMPs recommended azithromycin at baseline with only 2% using the recommended 2 gm single dose. At three months following the training, 49.5% of RMPs recommended azithromycin with 39.4% using the recommended dose (Table 3). The recommendation to benzathine penicillin for the treatment of syphilis did not change markedly, but more practitioners used the recommended single dose of 2.4 millionunits IM, from 4.0% at baseline to 16.1% at follow-up ($p = 0.004$). Use of recommended single dose 2.0 gm metronidazole for treatment of vaginal discharge syndrome only increased from 4.0% to 10.3% at follow up ($p = 0.35$). Knowledge that drug resistance could be related to subsequent antibiotic failure due to inappropriate drug usage/dosing and/or patient compliance significantly increased from 28.3% at baseline to 41.4% at follow-up ($p = 0.03$).

Referral practices: Out of 99 RMPs attended in the training sessions, 43 of them made 326 referrals in three months time following their training. Maximum referrals were made for genital ulcer diseases (45.4%) followed by urethral discharge (29.9%) and vaginal cervical discharge (26.5). RMPs referred their patients to formal sector facilities more often that they reported doing so previously. Patients were mostly (59.8%) referred to private clinics, while 17.3% of the patients were referred to specialist general practitioners.

4. Discussion

Rural medical practitioners are the major care providers in rural Bangladesh. Many of the surveyed RMPs had

inadequate academic qualifications and training to practice modern medicine, yet they encounter a sizable number of patients in their daily practice, many of whom have STIs. Most of the RMPs in this study had inadequate knowledge about STI/HIV/AIDS. A similar conclusion of low RTI/STI knowledge was reported among village doctors in a study of reproductive health in rural Bangladesh [17]. Most RMPs sell medicine (90.7%) to their clients alongside their practice as a principal income source, since most of them do not take a patient fee (82.2%). This creates a powerful incentive to over-prescribe and over-medicate patients. A significantly higher proportion of RMPs with paramedical training are more likely to provide paper prescriptions to their patients. These trained RMPs are more likely to charge a fee, but less likely to sell medications directly and much more likely to advise laboratory tests for diagnosis of STIs. RMPs with better quality professional training are less conflicted in their interests since they are not profiting directly from sales of drugs. We did not investigate the quality and type of drugs, nor the type of laboratory investigations that were recommended.

Recommendation to use of first line antibiotics for treatment of common STIs was moderately common among this group of rural practitioners, but the inappropriate drug selection and doses were evident with respect to the national STD syndromic guidelines [19]. For example, most of the RMPs reported prescribing metronidazole for treatment of abnormal vaginal discharge (83.8%) but only 4% used the recommended regimen of 2 gm single dose at baseline. Many of the RMPs recommended incorrect dosages for incorrect durations as per the national syndromic management guideline, possibly for financial reasons. Such inappropriate use of antibiotics is likely to result in antibiotic resistance in countries like Bangladesh. Ciprofloxacin was considered to be highly effective for gonococcal treatment until it was found that 49% of the strains collected in a study in Bangladesh were quinolone resistant [20] [21]. Because of widely prevalent ciprofloxacin-resistant gonococcal strains in Bangladesh, azithromycin is now suggested for treatment of urethral discharge per national syndromic guidelines (a recommendation that was also emphasized in our STI/RTI orientation training sessions). However, the proportion of RMPs who recommended ciprofloxacin for urethral discharge was not found to be significantly decreased at the follow-up survey compared to the baseline survey (52% vs. 48%). Given RMPs central role in rural healthcare, the improvement of their knowledge and practices related to STIs management through short-term training is crucial in enabling RMPs to use antibiotics appropriately and preventing antibiotic resistance.

Our study shows that the implementation of a two-day training program can be effective in improving the RMP's STI/HIV/AIDS knowledge and apprehension of recommended medications and dosages for the treatment of curable RTI/STI. Training was well received and improvements, albeit modest was well documented in both knowledge and practices of the RMPs. There is still considerable room for improvement in RMPs knowledge and practices; perhaps a longer training program would have a greater impact on knowledge and STI treatment practices. A systematic review on role of informal health care providers in developing countries and another study report on the management of reproductive tract infections in rural Bangladesh recommended to undertake educational interventions and capacity building exercises forum qualified village doctors, given their role as major care providers in rural areas [13] [17]. Our study reinforces the importance of this mandate in Bangladesh context.

This study was limited to apurposively selected sub-district in Bangladesh with the study outcome concentrated only to sexually transmitted infections. Generalization of study findings to other types of diseases should be done with caution. Caution is needed in the interpretation of the data because of lack of control group for comparison and the relatively short follow-up period. We did not have any immediate post training evaluation; therefore, we are not certain if changes in knowledge would have occurred anyway, without the intervention. However, that seems unlikely because the follow-up was done after three months of training and also other studies that used control group also reported similar change in knowledge as outcomes.

It is evident from the findings of this study and also through other studies [17] [22] [23] that informal providers like RMPs are capable of learning and changing their practices, even after a brief educational intervention. We call for further operations research to study how best to mobilise interactive training and multi-faceted educational interventions for RMPs to better engage them in health care for prevention and control of STIs and other health conditions by taking care of the country specific regulatory framework.

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Conflict of Interest

Authors declare no conflict of interest.

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