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Evaluation of Quality of Care in DOTs Centers under National Tuberculosis Control Program in Dhaka City

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Abstract

Introduction: Many countries faced problem with inaccessibility to the facilities of TB treatment, which ended up with limited success in controlling TB. The problem has been addressed through the integration of national tuberculosis programme with general health services, which is implementation of internationally recommended TB control strategy, DOTs (Directly Observed Therapy with short course chemotherapy) strategy. In Bangladesh this initiative has largely been taken by some established NGOs with which the government is collaborating. The programme has been being implemented at the field level for more than two decades. In 2014 we assessed the quality of care in the DOTs centers by measuring the facilities and programme outcomes.

Materials and methods: We collected both providers' and patients' perspectives by employing pretested questionnaires. To draw the providers' perspectives, the field team interviewed 92 health workers and for patients' perspectives the field team interviewed 357 patients from the selected DOTs centers. We presented data by calculating the frequency of each assessment indicators.

Results: We observed that 59% centers had staining facilities at the center. In 99% centers they had medicine available all the time. 76% patients stated that the distance between centers and their residences is <1 kilometer. 97% centers had accessible road to the centers. 76% providers knew consequences of treatment failure. 31% patients knew the mode of transmission. 1% patients knew the duration of treatment. 73% patients knew consequences of treatment failure.

Conclusion: Almost all the DOTs centers ensured availability of medicine. Most of the DOTs centers are located near to the enlisted patients' residences and are accessible through public transportation. However, knowledge of TB transmission and fate is unclear among both the providers and the patients. New programme approach could be explored to improve the knowledge level of controlling tuberculosis to optimum.

Keywords: Quality of care; Tuberculosis; DOTs; Knowledge

Introduction

According to World Health Organization (WHO), global incidence of tuberculosis (TB) is 125 cases per 100,000 populations. Geographically, the burden of TB is highest in Asia and Africa. In Asia, India and China together account for almost 40% of the world's TB cases [1]. In Bangladesh, TB mortality rate is higher compared to other SEAR (South East Asia Regional) countries. Current prevalence of TB is 435 per 100,000 population and the incidence is 225 per 100,000 population, in Bangladesh [2]. In 1993 WHO declared TB a global public health emergency. WHO's current recommended approach for TB care and control, launched in 2006, is the Stop TB strategy. This strategy has been linked to new global targets for reduction in TB cases and deaths by 50% within 2015 [1].

In most of the countries the government is primarily responsible for TB control programme. However, approximately a decade back, the ministry of health faced problem with inaccessibility which ended up with limited success in controlling TB. Afterwards many low income countries addressed this problem through integration of NTPs (National Tuberculosis Programme) with general health services, which is implemented through internationally recommended TB control strategy, DOTs (Directly Observed Therapy with short course chemotherapy) strategy. In Bangladesh the initiative for community involvement has largely been taken by some established NGOs with which the government of Bangladesh is collaborating for implementation of the National Tuberculosis Programme [2].

The provision of diagnosis and treatment according to the DOTs/Stop TB strategy has resulted in major achievements in TB care and control. Between 1995 and 2012, 56 million people were successfully treated for TB in countries that had adopted the DOTs/Stop TB strategy [3].

MDR-TB (Multi Drug Resistant-TB) is one of the greatest threats to TB control. About 3.6% of new tuberculosis (TB) patients in the world have multidrug-resistant strains (MDR-TB). Levels are much higher in those previously treated for TB, about 20%. Control of MDR-TB requires sound implementation of DOTs to prevent the occurrence of new cases and a careful introduction of second-line drugs, with adequate laboratory support [4].

In mid income countries like Bangladesh, overcrowding, lack of adequate infrastructure, and high level of unawareness make TB programme challenging. In Bangladesh the TB control programme has been implemented by Government-NGO collaboration since 1993. We assessed the quality of care in DOTs under TB control programme in Dhaka city to explore the current situation in terms of facilities, knowledge, accessibility and programme outcomes to achieve the goal.

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Materials and Methods

We assessed quality of care in DOTs under TB control programme in Dhaka city, operated by four organizations BRAC, UPHCP, SSFP and the Government. We collected data from February to May 2014. We employed a team of 12 field workers with a field coordinator for data collection and supervision. Pretested questionnaires were employed to interview the study participants. The protocol of the study had been approved by the Institutional Review Board, BRAC prior to the study. Informed written consent was taken from each selected study participants. For providers' perspectives the field team interviewed 92 health workers from selected 92 centers from a population of 135 centers, calculated through finite population corrected sample size. For patients' perspectives the field team interviewed randomly selected 357 patients who were under DOTs from the selected centers. We selected 4 patients from each selected center. In this study the caregivers are the primary health workers who delivers medicine to the patients. Almost all four organizations deliver medicine through trained health workers at the center. In few cases they have provision to deliver the medicine at patient's place.

Under five broad headings (a) care by practitioners, (b) knowledge, (c) interpersonal relations, amenities, (d) care implemented by patients and (e) care implemented by communities) the frequency for each indicators from both caregivers' and patients' perspectives were calculated. Regression analysis was done to see the differences in caregivers' perspectives among organizations. We analyzed data using Stata. We assessed the quality of care in three levels, structure, process and outcomes of the care relating to both the patients' and providers' perspectives in each level [5].

Results

We collected data from 92 caregivers from selected 92 DOTs centers and from 357 patients from those centers. The field workers obtained information from the patients and caregivers regarding 1) care by care givers which includes the facilities within the centers, presence of equipment and extent of monitory involvement at participatory level, 2) knowledge of TB transmission and treatment, 3) interpersonal relation during receiving and giving the treatment, 4) Amenities include convenience, comfort and privacy, 5) Care implemented by patients includes indicators for treatment outcomes and those that contribute to treatment outcomes. 6) Care implemented by communities includes indicators for access to care.

Care by caregivers

According to care givers' statements, 59% DOTs centers had staining facilities at the center, and all centers that had staining facilities, had a separate room for staining. In 99% DOTs centers, medicine was available all the time, in 98% DOTs centers they had a separate place for TB medicine. In 84% DOTs centers, they had waiting room for the patients. In 90% DOTs centers, they had waste baskets at the center. Among organizations, there is significant difference in having a waiting room for the patients and waste baskets at the center ($p<0.05$). However, there is no significant difference in having staining facilities, separate room for staining, separate place for TB medicine and in availability of medicine at the center among the organizations. In 8% DOTs centers, they had own X-ray facilities.

According to patients' statements, 47% patients' sputum tests were performed at the DOTs centers and 46% were diagnosed as TB cases at the DOTs centers.

According to care givers' statements, 8% DOTs centers charged fees for initial visit and in 2% centers charged fees for each visit. None of these centers charged for medicine. According to patients' statements, 4% patients paid for initial visit. None of the patients paid for TB medicine (Tables 1 and 2).

Knowledge

Ninety three percent caregivers knew the mode of transmission of pulmonary tuberculosis. Ninety nine percent caregivers knew the duration of the treatment. Forty percent caregivers knew the consequences of treatment. Seventy six percent caregivers knew consequences of treatment failure. Thirty one percent patients knew the mode of transmission. One percent patients knew the duration of treatment. Ninety eight percent patients knew the consequences of treatment. Seventy three percent patients knew consequences of treatment failure. However, among the organizations, there is no significant difference in knowledge of TB transmission and treatment among the caregivers (Tables 3 and 4).

Interpersonal relations

While treating patients, caregivers did not face any problem dealing with patients. However, in 67% centers, caregivers stated that patients can complain regarding the courses and duration of treatment. There is no significant difference in caregivers' statements regarding patients' rights among the organizations. According to patients' statements, 20% patients had complaints against the duration of the treatment. All patients stated that caregivers spent sufficient time while treating (Tables 5 and 6).

Amenities

Regarding convenience, the distance of DOTs centers from the patients' residences was asked. Seventy two percent caregivers stated that patients' residences were more than a kilometer from the centers. There is no significant difference in care givers statements regarding distance between the centers and residences among the organizations.

Indicators	n/N	%
Facilities		
Caregivers' statements		
Had staining facilities*	54/92	59
Had a separate room for staining*	54/92	59
TB medicine was available all the time	91/92	99
Had a separate place for TB medicine*	90/92	98
Maintains chart for dose schedule	90/92	98
Had a waiting room for patients*	77/92	84
Had waste baskets at the center*	83/92	90
Patients' statements		
Sputum test was performed at the DOTs centers	168/357	47
Diagnosed as TB at the DOTs center	166/357	46
Equipment		
Center had own X-ray facilities*	7/92	8
Money		
Caregivers' statements		
Patient needs to pay for the 1st visit	7/92	8
Patient needs to pay for each visit	2/92	2
Patient needs to pay for TB medicine	0/92	0
Patients' statements		
Patient needs to pay for the 1st visit	16/357	4
Patient needs to pay for each visit	0/357	0
Patient needs to pay for TB medicine	0/357	0
*data were collected from spot check as well		

Table 1: Care by caregivers.

Indicators	BRAC		UPHCP		SSFP		Government		p-value
	n/N=26	%	n/N=35	%	n/N=24	%	n/N=7	%	
Had staining facilities*	17	65	15	43	16	67	6	86	0.36
Had a separate room for staining*	17	65	14	40	17	71	6	86	0.252
Had a separate place for TB medicine*	25	96	35	100	24	100	6	86	0.567
Maintains chart for dose schedule*	26	100	34	100	24	100	6	86	0.204
Had a waiting room for the patients*	16	61	33	94	23	96	5	71	0.037
Had waste baskets at the center*	18	69	35	100	24	100	6	86	0.013
Patient needs to pay for the 1st visit	1	4	2	6	2	8	2	29	0.09
Patient needs to pay for each visit	0	0	1	3	1	4	0	0	0.567
*data were collected from spot check as well									

Table 2: Care by caregivers in different organizations.

Indicators	n/N	%
Caregivers' statements		
Knew mode of transmission	86/92	93
Knew duration of treatment	91/92	99
Knew consequences of treatment	37/92	40
Knew consequences of treatment failure	70/92	76
Patients' statements		
Knew mode of transmission	110/357	31
Knew duration of treatment	5/357	1
Knew consequences of treatment	351/357	98
Knew consequences of treatment failure	260/357	73
Indicators	n/N	%
Caregivers' statements		
Knew mode of transmission	86/92	93
Knew duration of treatment	91/92	99
Knew consequences of treatment	37/92	40
Knew consequences of treatment failure	70/92	76
Patients' statements		
Knew mode of transmission	110/357	31
Knew duration of treatment	5/357	1
Knew consequences of treatment	351/357	98
Knew consequences of treatment failure	260/357	73

Table 3: Knowledge.

Indicators	BRAC		UPHCP		SSFP		Government		p-value
	n/N=26	%	n/N=35	%	n/N=24	%	n/N=7	%	
Mode of transmission	24	92	34	97	21	88	7	100	0.92
Duration of treatment	26	100	34	97	24	100	7	100	0.886
Consequences of treatment	8	31	15	43	12	50	2	29	0.46
Consequences of treatment failure	22	85	25	71	18	75	5	71	0.403

Table 4: Knowledge of the caregivers in different organizations.

Indicators	n/N	%
Caregivers' statements		
Faced problem while treating patients	0/92	0
Patients can complain about the treatment courses	62/92	67
Patients' statements		
Complained about duration of treatment	73/357	20
Caregivers spent sufficient time	357/357	100

Table 5: Interpersonal relations.

Indicators	BRAC		UPHCP		SSFP		Government		p-value
	n/N=26	%	n/N=35	%	n/N=24	%	n/N=7	%	
Faced problem while treating patients	0	0	0	0	0	0	0	0	____
Patients can complain about the treatment courses	15	58	26	74	17	71	4	57	0.641

Table 6: Interpersonal relations in different organizations.

Indicators	n/N	%
Convenience		
Caregivers' statements		
Patients come from within 1 Km	24/92	26
Patients come from more than 1 Km	66/92	72
Patients' statements		
Patients come from within 1 Km	273/357	76
Patients come from more than 1 Km	83/357	83
Patients get medicine at their convenient time	274/357	77
Patients take medicine regularly	352/357	99
Comfort		
Caregivers' statements		
Can take a day off whenever required	82/92	89
Can deliver the work if required	84/92	91
Patients' statements		
Comfortable in taking medicine at the center	155/357	43
Want to take medicine at their home	188/357	53
Face problem with the medicine	269/357	75
Privacy		
Caregivers' statements		
See the patients separately	92/92	100
Do not share information of one patient to another	79/92	86
Patients' statements		
See patients separately	334/357	94
Maintains secrecy about their information	335/357	94

Table 7: Amenities.

Indicators	BRAC		UPHCP		SSFP		Government		p-value
Convenience	n/N=26	%	n/N=35	%	n/N=24	%	n/N=7	%	
Patients come from within 1 km	15	58	5	14	4	17	0	0	___
Patients come from more than 1 km of distance	9	35	30	86	20	83	7	100	___
Comfort									
Caregivers can take day off whenever required	22	85	33	94	21	88	6	86	0.911
Caregivers can deliver their work if required	21	81	33	94	23	96	7	100	0.054
Privacy									
See patients separately	26	100	35	100	24	100	7	100	_____
Do not share information of one patient to another	22	85	30	86	20	83	7	100	0.579

Table 8: Amenities in different organizations.

However, 76% patients stated that the distance between the centers and their residences is less than a kilometer. Seventy seven percent patients stated that they got medicine at their convenient time. Ninety nine percent patients stated that they used to take medicine regularly.

Regarding comfort, in 89% cases, caregivers stated that they could take a day off whenever they required. In 91% cases caregivers could deliver their job to other co-workers if required. However, there is no significant difference in caregivers' statements on job satisfaction among organizations. Forty three percent patients stated that they were comfortable in taking medicine at their home. Seventy five percent patients stated that they had complaints on drugs.

Regarding privacy, 100% caregivers claimed that they see patients separately, and 86% caregivers claimed that they maintain secrecy of patients' information. However, there is no significant difference in caregivers' statements on maintaining patients' secrecy among organizations. Ninety four percent patients stated that they received medicine separately. Ninety four percent patients think that their personal information was kept secret (Tables 7 and 8).

Care implemented by patients

Eighty five percent providers thought that patients can follow the treatment guidelines. There is no significant difference in caregivers' statements regarding following the treatment guidelines by the care givers among organizations. However, there is significant difference in following treatment guidelines by the patients among organizations ($p<0.05$). None of the patients complained about the duration that was spent by the caregivers during treatment. All the patients thought that caregivers properly informed them regarding taking medicine and the date and time of following visit. Fifteen percent patients stated that they could change their visiting time if required.

Last one year's patient's record showed that on average 73 (57 to 89) patients were cured who received DOTs, 78 (60 to 94) patients completed therapy and among them 3(1 to 4) cases relapsed.

One percent of the patients stated that during the course of treatment they failed to maintain the schedule for DOTs. Twelve percent patients who were currently under DOTs had previous history of TB and among them 98% patients had taken medicines for TB. However, among those who received DOTs before, 60% completed the course (Tables 9 and 10).

Care implemented by communities

Ninety seven percent centers had accessibility to public transport. Among organizations, there is significant difference in having

Indicators	n/N	%
Contribution of Caregivers		
Caregivers' statements		
Follows the treatment guidelines	78/92	85
Patients' statements		
Spent sufficient time for patients	357/357	100
Caregivers explained the patients about proper way of taking medicine	357/357	100
Caregivers mentioned the patients about the date of next visit	357/357	100
Caregivers mentioned the patients about the exact time of next visit	357/357	100
Patients can change the visiting time if required	53/357	15
Treatment Outcomes		
Cured*	73 (57-89) †	_
Completed therapy*	78 (60-94) †	_
Relapse *	3 (1-4) †	_
Dropped visit	5/357	1
H/O previous TB	43/357	12
Taken medicine before	42/43	98
Completed the treatment course last time	25/42	60
*data were from last one year's record, †calculated average		

Table 9: Care implemented by patients.

Indicators	BRAC		UPHCP		SSFP		Government		p-value
Contribution of caregivers	n/N=26	%	n/N=35	%	n/N=24	%	n/N=7	%	
Follows the treatment guidelines	20	77	33	94	20/24	83	5	71	0.956
Contribution of receivers									
Follows the treatment guidelines	14	54	6	17	24-Mar	13	1	14	0.003

Table 10: Care implemented by patients in different organizations.

Indicators	n/N	%
Access to care*		
Geographic		
Have accessible road for public transportation	89/92	97
Patients come from outside the catchment area of the center	40/92	43
Economic		
Less expensive to come to the center	23/92	25
Organizational		
Health workers deliver the medicine at patients' places	Nov-92	12
Had provision to store medicine at the centers	91/92	99
*data were obtained from caregivers		

Table 11: Care implemented by communities.

Indicators	BRAC		UPHCP		SSFP		Government		p-value
Geographic	n/N=26	%	n/N=35	%	n/N=24	%	n/N=7	%	
Have accessible road for public transportation	14	54	6	17	3	13	1	14	0.003
Patients come from outside the catchment area	14	54	6	17	3	13	1	14	0.003
Economic									
Less expensive to come to the centers	3	12	8	23	9	38	3	43	0.021
Organizational									
Delivers medicine at patients' places	2	8	5	14	3	13	1	14	0.582

Table 12: Care implemented by communities in different organizations.

accessible road to the centers for public transportation. In 43% centers patients even came from outside the catchment area of a particular center. Among the organizations, there is significant difference in centers receiving patients beyond their catchment area ($p<0.05$). Twenty five percent providers said that the transportation cost to the center from their residence was less expensive. Among organizations, there is significant difference in expenditure for travelling to the centers ($p<0.05$). Twelve percent centers had health workers to deliver medicine at the patients' place. Ninety nine percent centers had capacity to store medicine (Tables 11 and 12).

Discussion

To draw inference, we divided the results under three broad headings; structure, process and outcomes [5]. Structure denotes the facilities that had been provided by the programme, process denotes the patients' and providers' situation and action in the definite setup and outcome denotes the effect from the programme.

Structure

Due to limited resources and lack of skilled technologists [6]

nearly half of the centers had no staining facilities to confirm TB cases. However, most of the centers ensured cleanliness and patients' comfort, which reduces the transmission of germ at healthcare facilities [7,8]. On the contrary, only half of the centers ensured availability of medicine, thus point of service at patients' places through trained volunteers may reduce the drop out cases [9]. Free DOTs services ensured completion of therapy among all, irrespective of patients' socioeconomic status [10,11]. Even though very limited centers had X-ray facilities, strong referral system had been maintained to confirm early detection of positive and active cases [12].

Process

The DOTs centers were located near the enlisted patients' residence that reduces time and travel cost. However, patients are willing to take medicine to their home to maintain regularity [13]. In spite of the comfort of taking medicine to their home, in three out of four cases, patients complained about the drugs [14]. To give more comfort to the patients, patients are treated separately to minimize the psychosocial trauma related to taboo regarding TB in the community [15,16].

Outcomes

Irrespective of poor knowledge of disease transmission, fate and the duration of treatment among the patients, high treatment completion rate proves effective approach of DOTs. Moreover, the centers' records showed very few relapse cases due to non-completion of course, indicating effectiveness of directly observed therapy [17].

Conclusion

Strengthening of existing DOTs centers under TB control programme by ensuring treatment and diagnostic facilities in all the centers could be an approach for early diagnosis and treatment. Additional approach to mass level of education on DOTs and TB transmission would be introduced to improve knowledge. To reduce the incidence of TB, DOTs centers might be equipped with vaccination programme parallel to the existing EPI programme in Bangladesh.

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