

## A Comparative Study on Community Based DOTS service and Health Institution Based DOTS service among TB Patients

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### ABSTRACT

Tuberculosis (TB) is the most problematic and highly prevalent communicable disease affecting about one-third of the world's population and debilitating pulmonary (PTB) infection today. In spite of all these efforts by the government of Nepal, many people still die every year and transferring the disease to the healthy person. The new approach for the effective treatment of tuberculosis has been introduced i.e. Community Based Directly Observed Treatment Short Course (CB-DOTS) which provides training to community health workers to increase awareness, detection, and treatment of TB and bring services directly to the homes of those at risk for infection and those who are infected. The aim of this study was to compare availability, accessibility, compliance and satisfaction between CB-DOTS service and health institution based DOTS (HI-DOTS) service among TB patients. A cross sectional study was carried out in Kaski and Tanahun district in 2014. Census was conducted for the TB patients who are registered during 6 months in the community based DOTS with same number and same time period, that had been enrolled in DOTS from health institution were chosen. The collected data was entered in EPI-DATA and analyzed by using the software SPSS-16. In HI-DOTS the average traveling time to get TB drugs is  $\leq 30$  minutes for 56.8 percent respondents and in CB-DOTS majority of the respondents; 90.9 percent have to travel  $\leq 30$  minutes. In HI-DOTS majority; 84.1 percent were dissatisfied and only 15.9 percent were satisfied. Just opposite to this, majority (81.8%) of respondents utilizing CB-DOTS service were satisfied and only 18.2 percent were dissatisfied. There is highly significant association between the patient's satisfaction and two different DOTS services ( $p < 0.001$ ). CB-DOTS service approach shows its better effectiveness in availability, accessibility, compliance and patient's satisfaction aspects. CB-DOTS is a viable option and can complement and strengthen the existing HI-DOTS, especially in developing countries like Nepal where the health system is overwhelmed with increasing number of TB patients and high TB related deaths.

**Key words:** Community Based Directly Observed Treatment Short Course, Availability, Accessibility, Satisfaction

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### INTRODUCTION

Tuberculosis (TB) is an endemic communicable disease which is the problematic worldwide and mostly in many developing countries as it is directly related to poverty and nutrition, and on other hands efforts at eliminating the disease also remain very unsuccessful although many efforts from the past have been attempting to change the situation.<sup>1</sup>

After adoption of the new Stop TB strategy in 2006, NTP has implemented all six components (i.e. pursue high quality DOTS expansion and enhancement, address TB/HIV, MDR-TB and

other challenges, contribute to health system strengthening, engage all care provider, empower people with TB and communities and enable and promote research) to reduce the burden of TB and achieve Millennium Development Goals and STOP TB partnership targets by 2015.<sup>2</sup>

Stop TB partnership target assumes that by 2015 the global burden of TB (disease prevalence and deaths) will be reduced by 50% relative to 1990 levels. The number of people dying from TB in 2015 should be less than about 1 million, including those co-infected with HIV. Similarly, by 2050 the

global incidence of TB disease will be less than 1 case per million populations per year.<sup>3</sup>

Tuberculosis represents, according to World Health Organization (WHO), one of the most leading causes of death worldwide. With nearly 8 million new cases each year and more than 1 million deaths per year, tuberculosis is still a public health problem.<sup>4</sup> About a third of the world's population is estimated to be infected with tubercle bacilli, and hence at risk of developing active disease and in developing countries, TB comprised 25% of all avoidable adult deaths.<sup>5</sup>

DOTS which have been successfully implemented since April 2001, is the patient - centered approach ensuring that they complete their full six months course of treatment and with the same objectives but with different perspectives and setting, community-based directly observed treatment, short-course (CB-DOTS) for tuberculosis was started from March 2014 in some part of the country which involves training of community health workers to increase awareness, detection and treatment of TB and brings services directly to the homes of those at risk for infection and of those who are infected.

NTP in 2006 after adoption of the new Stop TB strategy to reduce the burden of TB and achieve Millennium Development Goals and STOP TB partnership targets by 2015 planned with different components and strategies. The case finding rate of new smear positive TB cases was 77.5% which was more than 4% compared to the achievement of last year and case notification rate is 55.41/100k population.<sup>2</sup>

Nepal's commitment to achieve and sustain the Sustainable Development Goals by 2035 by 2015 has pushed policy makers, programme managers and practitioners to take more aggressive tuberculosis (TB) control measures. Introduction of DOTS has already reduced the number of deaths from TB; however, 5,000-7,000 people still die every year.<sup>6</sup>

With a population of about 27 million, Nepal had an estimated incidence and prevalence rate of all forms of TB of 163 and 241 per 100000 populations, respectively, in 2012. The notification

rates of all forms of TB and new smear-positive cases were 128 and 55, respectively, showing no significant change in the past decade despite sustained high case detection and treatment success rates, increased access to DOTS through decentralization of services, outreach projects and strong community involvement.<sup>7</sup>

For the purpose of increase in availability and accessibility of DOTS among vulnerable groups (disable person, ageing people, pregnant and children) of a society and population who are far from health institution, NTC has a piloted new intervention CB-DOTS. It is currently running in five different districts of each development region. Institutional DOTS has been running since around last two decades but still 5000-7000 people are still dying. About 45 percent of the total population is infected with TB and still 10,000 cases are missing. So all these problem should be minimized or reduced with new intervention/strategy as CB-DOTS. So this study was trying to compare the availability and accessibility of health care services, compliance to drugs and patient's satisfaction between CB-DOTS service and HI-DOTS service among TB patients.

The objective of this study is to compare the availability and accessibility of health care services, compliance to drugs and patient's satisfaction between CB-DOTS service and HI-DOTS service among TB patients.

## **METHODS**

A cross sectional study was adopted to compare the availability and accessibility of health care services, compliance to drugs and patients satisfaction between CB-DOTS service and HI-DOTS service among TB patients. Quantitative method was adopted. All registered TB patients who were receiving DOTS treatment within in both CB- DOTS in Kaski district which is one of the first district to launch CB-DOTS programme and health institution based DOTS in Tanahun district who were on treatment was enrolled in the study. The study was conducted in different health institution of Tanahun district and home visit of the patients who were enrolled in community based DOTS service in Kaski district. Census was conducted for the TB patients who are registered

during 6 months (March 15, 2014 to September 16, 2014) in the community based DOTS service i.e. 44 patients and in the same number within the same time period that had been enrolled in DOTS from health institution were chosen. Five health institutions of Tanahun district were selected with maximum number of patients then according to number of patients in each health institutions the required sample which was equal in number to CB-DOTS service was selected proportionately. The proportion of the sample with the study population was 64 %. So at least 64 percent samples were drawn from each DOTS center. All TB patients who were under treatment in health institution based DOTS and CB-DOTS were enrolled. EPI-DATA was used for data entry and after exporting to SPSS 16.0 different statistical analysis had performed.

## RESULTS

Most of the respondent's 44.3 percent were in between 20-39 years age group and it was found that the least 13.6 percent population comprises within less than 20 years of age. Out of total 88 from both DOTS patients 59.1 percent were female and 40.9 percent were male.

1. Assessment of the availability of the health care services

**Table 1: Distribution of respondents by availability of health care services and DOTS service**

Characteristics	DOTS	
	HI-DOTS n (%)	CB-DOTS n (%)
Availability of health worker/ treatment volunteer in every visit	(n=44)	(n=44)
Yes	44 (100)	44 (100)
No	0	0
Faced scarcity of drugs	(n=44)	(n=44)
Yes	0	0
No	44 (100)	44 (100)
Number of times patient supervised	(n=2)	(n=20)
1 time	1 (50)	4 (20)
2 times	1 (50)	12 (60)
3 times or above	0	4 (20)

Ever faced side effects by drugs	(n=44)	(n=44)
Yes	26 (59.1)	31 (70.5)
No	18 (40.1)	13 (29.5)

Among HI-DOTS 50 percent were supervised only one time and remaining 50 percent were supervised for 2 times. Similarly, among 20 respondent supervised in CB-DOTS 60 percent were supervised for 2 times, 20 percent for 1 time and remaining other 20 percent were supervised for 3 times or above.

The above table also shows that majority of the respondent from CB-DOTS 70.5 percent had faced some types of side effects by drugs and in HI-DOTS 59.1 percent respondent had faced side effects by TB drugs.

2. Assessment of the accessibility of the health care services

**Table 2: Distribution of the respondents by accessibility of health care services and DOTS service**

Characteristics	DOTS	
	HI-DOTS	CB-DOTS
	n (%)	n (%)
0.1625 in	(n=44)	(n=44)
Any time	5 (11.3)	1 (2.3)
Morning	31 (70.5)	40 (90.9)
Afternoon	8 (18.2)	2 (4.5)
Evening	0	1 (2.3)
Faced long duration time for seeking treatment services	(n=44)	
Yes	10 (22.7)	0
No	34 (77.3)	0
Waiting time	(n=10)	
< 1 hour	7 (70)	0
Up to 1 hour	3 (30)	0
Visit to treatment center/ treatment spervisorfor medication	(n=44)	(n=44)
Regular	32 (72.7)	35 (79.5)
Irregular	11 (25.0)	6 (13.6)
Never	1 (2.3)	3 (6.9)

For both of the DOTS patients the appropriate time to take TB drugs was morning time in which 70.5 percent HI-DOTS respondents and 90.9 percent CB-DOTS respondents included.

Only the respondents of HI-DOTS responded to the long duration time for seeking the treatment

services. 22.7 percent responded that they have to wait certain time for receiving the treatment services and remaining majority of the respondent 77.3 percent responded they didn't have to wait for seeking the services. Among 10 respondents from HI-DOTS who had to wait long duration for seeking services 30 percent had to wait up to 1 hour and 70 percent respondent had to wait for < 1 hour.

Among 44 respondents in HI-DOTS majority of the respondents 72.7 percent regularly visit the DOTS center, 25 percent visit irregularly and remaining 2.3 percent never visit to the DOTS center.

Similarly, in CB-DOTS among 44 respondents 79.5 percent regularly visit to treatment supervisor, 13.6 percent visit irregularly and only 6.9 percent respondent never visit to treatment supervisor/FCHVs. Among the total respondents from HI-DOTS who irregularly or never visit to DOTS center are provided drugs by their household member 82.4 percent, and remaining by health workers/FCHVs and others (friends). Similarly, in CB-DOTS 77.8 percent respondent who irregularly or never visit to treatment supervisor receive drugs at home by treatment supervisor and remaining 22.2 percent by house hold members.

### 3. Accessibility of health care services and DOTS service

**Table 3: Association between accessibility of health care services and DOTS service**

Characteristics	DOTS		χ <sup>2</sup> (df)	P-value	OR (95%CI)
	HI DOTS (n=44)	CB DOTS (n=44)			
	n (%)	n (%)			
<b>Appropriate travelling time to get treatment services</b>					
≤ 30 minutes	25 (56.8)	40 (90.9)	13.24 (1)	<0.001**	7.60 (2.31-24.94)
Above 30 minutes	19 (43.2)	4 (9.1)			
<b>Use of transportation media</b>					
Yes	21 (47.7)	2 (4.5)	21.249 (1)	<0.001**	19.17 (4.12-89.16)
No	23 (52.3)	42 (95.5)			

\*p<0.05, \*\*p<0.001

The average travelling time to get TB drugs is ≤ 30 minutes for 56.8 percent respondents from HI-DOTS and for the CB-DOTS patients' majority of the respondents 90.9 percent have to travel ≤ 30 minutes and only 9.1 percent respondents had to travel > 30 minutes to receive treatment services (Table 3). Finding shows that there is high significant difference in the average travelling time between HI- DOTS and CB-DOTS service (p<0.001). Regarding the appropriate travelling time to had access to treatment services patients utilizing CB-DOTS were approximately 7 times more likely to travel long distance than patients

utilizing HI-DOTS service (OR 7.60; 95% CI 2.31-24.94).

More than one third of the respondents 47.7 percent from HI-DOTS use the different types of transportation media and only 4.5 percent of the respondents from the CB-DOTS use different transportation media to easy access to treatment service. The finding shows that there was high significant difference in use of transportation media between HI-DOTS and CB-DOTS (p<0.001). For patients utilizing CB-DOTS service were nearly 19 times more likely to use transportation.

## 4. Assessment of the patient's satisfaction regarding the DOTS services

**Table 4: Association between the patient's satisfaction and DOTS services**

Characteristics	DOTS		$\chi^2(df)$	P-value	OR (95%CI)
	HI DOTS	CB DOTS			
	(n=44) n (%)	(n=44) n (%)			
<b>Satisfaction</b>					
Satisfied	7 (15.9)	36 (81.8)	38.24 (1)	P<0.001**	23.78 (7.81-72.41)
Dissatisfied	37 (84.1)	8 (18.2)			

\*\*p&lt;0.001

The table 4 shows that out of total respondents in HI-DOTS majority 84.1 percent were dissatisfied and only 15.9 percent were satisfied. Similarly, in respondents utilizing CB-DOTS service majority 81.8 percent were satisfied and only 18.2 percent were dissatisfied. The finding shows that there is highly significant association between the patient's satisfaction and two different DOTS services ( $p<0.001$ ). Regarding the satisfaction patients utilizing CB-DOTS service were approximately 23 times more likely to be satisfied to the overall DOTS treatment services than the patients utilizing HI-DOTS services.

**DISCUSSION****Availability of health care services to the patients**

This study shows that 100 percent availability of health worker and drugs for the treatment purpose in both of the DOTS services which is similar to the study of Paudel DP (2006) based on only health institution based DOTS which shows that 97 percent availability of health workers and 99 percent availability of drugs which were necessary for the treatment purpose of the TB patients.<sup>7</sup> The study reveals that 88.6 percent CB-DOTS patients were provided counseling and only 65.9 percent to HI-DOTS patients. A study based on CB-DOTS showed that only 58.41 percent patients were counseled on general information of TB.<sup>5</sup> This difference is may be due to small sample size of comparable study.

This study shows that there is better availability of counseling on general information on TB, availability of supervision by higher authority to patients in CB-DOTS service in comparison to the HI-DOTS service.

**Accessibility to health care services to the patients**

This study shows that 90.9 percent patients from CB-DOTS have to travel less than 30 minutes which is 58.6 percent in HI-DOTS patients. This is due to available of treatment service within ward level within the periphery of 30 minutes travelling distance in CB-DOTS. A study based on CB-DOTS shows that 34.66 percent patients have to travel  $\geq 30$  minutes to have access to treatment service. The difference in percentage with this study may be due to large sample size of the reference study literature. But a study based on HI-DOTS shows that only 8 percent patient have to travel  $\geq 30$  minutes. This small difference may be due to selection of patients in randomization with less distance travelling to have access to treatment service.<sup>6,8</sup>

In this study 47.7 percent patient from HI-DOTS have to use transportation media to reach to the treatment center but in CB-DOTS only 4.5 percent patient's use transportation media to have access to treatment service. This study also includes that from HI-DOTS patients' majority 38.1 percent have to pay less than 50 rupees daily and other 38.1 percent also have to pay more than 100 rupees per day and remaining in between them. A study based on HI-DOTS shows that 53 percent patients paid less than 10 rupees per day and remaining 47 percent paid more than 10 rupees.<sup>9</sup>

70 percent of the patients from HI-DOTS have to wait < 1 hour and remaining 30 percent have to wait up to 1 hour to have access to treatment service but in CB-DOTS patients have easy access to treatment services without any waiting time according to finding of this study. A similarity

was seen in the study based on HI-DOTS which shows 73 percent have to wait < 15 minutes and 27 percent wait for  $\geq$  15 minutes.<sup>8</sup>

### **Patient's satisfaction in treatment services based on types of DOTS**

The study shows that 81.8 percent patients from CB-DOTS were satisfied and only 15.9 percent patients from HI-DOTS were satisfied. The more satisfaction towards the service provided by CB-DOTS is because of patients centered approach through appropriate provision of counseling on TB, short distance for service access, less or no waiting time for treatment service and regular supervision.

### **CONCLUSION**

Community Based DOTS service approach was best available for the purpose of counseling in general information on TB and patients supervision in comparison to Health Institution based DOTS service approach. TB patients on the CB-DOTS treatment option had better access with less travelling time, cost effectiveness and no problem of long waiting time period for the treatment service in comparison to the HI-DOTS patients. Similarly, patients from CB-DOTS were more satisfied in different aspects of availability of health care services and easy access to the treatment services in comparison to the patients in HI-DOTS service approach.

CB-DOTS service approach shows its better effectiveness in availability, accessibility, compliance and patients satisfaction aspects. CB-DOTS is a viable option and can complement and strengthen the existing HI-DOTS, especially in countries like Nepal where the health system is overwhelmed with increasing number of TB patients and high TB related deaths. The advantages experienced by patients who were utilizing their CB-DOTS service approach outweighed the disadvantage which was showed by the HI-DOTS service.

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