

To evaluate the performance of DOTS provider in the field practice area of PHC, Farukhnagar, Gurugram, Haryana.

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Abstract

Tuberculosis is a worldwide public health problem despite the fact that the causative organism was discovered more than 100 years ago and highly effective drugs and vaccine are available making tuberculosis a preventable and curable disease. Despite the fact that TB is a treatable disease, it has assumed epidemic proportions globally¹⁰. M. tuberculosis has existed throughout history. Around one-third population of the world is suffering from infection with tuberculosis bacillus, and each year eight million people develop tuberculosis disease which annually kills 1.8 million worldwide. Approximately 80% of TB cases are found in 23 countries; the highest incidence rates are found in Africa and South-East Asia¹¹. In pulmonary cases, Mycobacterium tuberculosis is mainly lodges itself at the apex area of upper lobe as it is high oxygen demanding highly aerobic organism. Humans are the only known reservoirs of M. tuberculosis. It may affect any system of the body.

INTRODUCTION

Tuberculosis is a worldwide public health problem despite the fact that the causative organism was discovered more than 100 years ago and highly effective drugs and vaccine are available making tuberculosis a preventable and curable disease. Despite the fact that TB is a treatable disease, it has assumed epidemic proportions globally¹⁰. M. tuberculosis has existed

throughout history. Around one-third population of the world is suffering from infection with tuberculosis bacillus, and each year eight million people develop tuberculosis disease which annually kills 1.8 million worldwide. Approximately 80% of TB cases are found in 23 countries; the highest incidence rates are found in Africa and South-East Asia¹¹. In pulmonary cases, *Mycobacterium tuberculosis* is mainly lodges itself at the apex area of upper lobe as it is high oxygen demanding highly aerobic organism. Humans are the only known reservoirs of *M. tuberculosis*. It may affect any system of the body.

The World Health Organization provided the background for controlling the disease, by introducing DOTS strategy¹². DOTS involves treatment with a four-drug regimen [INH, RIF, pyrazinamide, and ethambutol] for 6–9 months. DOTS must be used throughout the entire course of therapy for best cure rates. The core intervention involves a health worker who observes the patient when s/he is swallowing each dose of anti-TB medication. DOTS also involve the regular collection of sputum specimens until two consecutive samples test negative for the bacilli. Although DOTS is labour intensive, the standardized first-line regimen costs only around \$10 per patient and is associated with a 90% cure rate in the absence of drug-resistant strains.

There are five important components in Directly Observed Therapy Shortcourse (DOTS): political commitment (support and willingness of government), microscopy services (at various levels); drug supplies (Regularity); system of surveillance and monitoring and use of highly efficacious regimens; and direct observation of treatment. WHO generally uses the term to mean the five components of DOTS. But the word 'DOTS' is an abbreviation for Directly Observed Therapy Shortcourse. Patients can remain within their families and return to work within few weeks. This strategy has led to dramatic reduction in morbidity and mortality among TB patients, as well as reduction of multidrug resistant tuberculosis.

Due to availability of free diagnostic and treatment services and assistance of detection through sputum smear microscopy experiments at all levels of healthcare are the main principles for controlling the disease and ensuring execution of this strategy.

There were many studies conducted across the world and which on the whole suggest that the control of TB by virtue of using DOTS treatment increases treatment success rate of 90-95% and at times even greater.¹³

DOTS was considered as the most meticulously planned, systemic and low cost way to restart the TB control programme in India. According to the goals of RTNCP, By those five elements, it was supposed to achieve and maintain a cure rate of at least 85% among newly detected infectious (new sputum smear positive) cases. And the second goal was to achieve and maintain detection rate of at least 70% of estimated new sputum positive cases in the population.¹⁰

The performance of any program is judged by certain performance indicators related with them, results achieved and the patient satisfaction. Performance indicator may be of qualitative and quantitative type. WHO has defined certain qualitative and quantitative performance indicators at various levels of implementation of the program but none to evaluate the performance of the DOT providers.

DOTS centres are proven to be the connecting link at the lowest possible level between TB patients and the health care workers e.g. ASHA, ANM and other DOTS providers.

Rationale for the study

Even though RNTCP has assured good number and percentage of the TB patients to be disease free. Time and again, RNTCP has been criticised as still the number of deaths from TB is too high. All the required inputs are very crucial and critical for the success of DOTS.

DOT Providers is the central and pivotal for the delivery of DOTS and hence for the success of RNTCP. Training and regular supply of consumables, drugs, syringes, patient cards, and drinking water facilities etc should be ensured. As DOTS is meant for better compliance adherence and better and faster result, its efficacy can be assessed by monitoring treatment outcome.¹⁴

Tuberculosis health visitors (TBHVs) as DOTS providers supervise and also by non-TBHVs additional health care such as Anganwadi workers, community volunteers, teachers, private practitioners, etc. Sufficient evidences are not found as well as effectiveness has not been well documented in India.

Accessibility, availability and acceptability in society are the main pillars for affectivity of any DOTS provider in the community. Thus the present study was carried out to evaluate the performance of different DOTS providers working under RNTCP in the study area.

MATERIALS AND METHODS

This Longitudinal Observational community based study among DOTS providers was conducted in field practice areas of PHC, Farukhnagar, Gurugram, Haryana. This study was conducted over a period of around 12 months (from December 2017 to November 2018) following the clearance of ethical committee.

STUDY DESIGN: The Longitudinal Observational community based study among DOTS providers was conducted in field practice areas of PHC, Farukhnagar, Gurugram, Haryana.

STUDY AREA/ STUDY CENTRE:

The study was conducted in field practice areas of PHC, Farukhnagar, Gurugram, Haryana.

STUDY POPULATION:

All DOTS providers were evaluated for performance using certain performance indicators related to service components of DOTS providers.

DURATION OF THE STUDY:

This study was conducted over a period of around 12 months (from December 2017 to November 2018).

METHODOLOGY

All DOTS providers were evaluated for performance using certain performance indicators related to service components of DOTS providers. The DOTS providers were assessed using a pretested predesigned interview schedule consisting of 10 questions as per the standard treatment card by RNTCP.

Each question was assigned by a single score card and final score card was assessed as:

0 -3: Poor performance
4-7: Average Performance
≥8 : Good performance

Indicators are

1. Initial Address Verification by DOTS Provider.
2. Ensure That Every Treatment Card Is Given A TB Number.
3. Each And Every Patient Diagnosed As A Case Of Tuberculosis Has Started The Treatment Within 7 Days Of The Diagnosis
4. Contacts Of Sputum Positive Cases Been Examined And The Results Been Recorded In The Treatment Card
5. Fixed The Time And Place For DOTS Keeping In View The Patient's Convenience And Operational Feasibility
6. Ensured That All Doses In Intensive Phase (IP) And The 1st Dose Of Each Weekly Blister During Continuation Phase (CP) Are Taken Under Their Observation And Side By Side Ensure Collection Of Empty Blisters In Continuation Phase?
7. Timely Examination Of Sputum At Defined Intervals
8. Maintain A Treatment Card And Update The Original Card At Primary Health Institution (PHI) On Fortnightly Basis
9. Retrieval Actions For Defaulter Patients
10. Partially Used Patient Wise Boxes (PWB's) Are Returned To PHI Within A Month Of Such Event

These indicators were evaluated from the newly diagnosed patients registered at the DOTS centre during the first 6 months of the period.

A visit was also made at the end of the treatment scheduled to find the treatment outcome. The treatment outcome was based on the current RNTCP

SELECTION OF CASES:

A subject satisfying all the inclusion criteria and none of the exclusion criteria was enrolled in the study.

Inclusion criteria:

1. DOTS Providers of either sex
2. DOTS Providers of any age group.
3. DOTS Providers willing to give informed consent and willing to undergo study.

Exclusion criteria:

1. DOTS Providers not willing to give informed consent and willing to undergo study.

SAMPLING TECHNIQUE

DOTS providers were being interviewed after checking their suitability as per the inclusion and exclusion criteria irrespective of their sex, religion, income, occupation, socio economic status and place of residence. In view of operational feasibility and single researcher, only DOTS providers in the field practice area of SGT medical college, Gurugram, Haryana.

SAMPLE SIZE

All DOTS providers in the field practice area of SGT medical college, Gurugram, Haryana. **STATISTICAL ANALYSIS**

Categorical variables were presented in number and percentage (%) and continuous variables were presented as mean \pm SD and median. If the normality is rejected then non parametric test were used. Quantitative variables were compared using Unpaired t-test (when the data sets were not normally distributed.) between the two groups. Qualitative variables were compared using Chi-Square test /Fisher's exact test. Odds ratio with 95% Confidence Intervals calculated for selected variables and their significance tested. U A p value of <0.05 were considered statistically significant. The data were entered in MS EXCEL spreadsheet and analysis were done using Statistical Package for Social Sciences (SPSS) version 21.0.

ETHICAL CONSIDERATIONS:

The study was conducted according to Good Clinical Practice guidelines (Amended version of Schedule Y, 2005, Declaration of Helsinki, ICH GCP and ICMR guidelines on research on human subjects, 2006) after permission of Institutional Ethical Committee, SGT medical college and Hospital, Gurugram, Haryana. Departmental permissions were taken as well. Ethics committee reviewed the protocol in view of the rights, safety, well being, health status, adverse event management and confidentiality of data of the patients.

WORK UP ALGORITHM

DOTS providers were enrolled in the study in field practice areas of PHC, Farukhnagar, Gurugram, Haryana after checking inclusion and exclusion criterion



The DOTS providers were assessed using a pretested predesigned interview schedule consisting of 10 questions as per the standard treatment card by RNTCP



Data Analysed and report writing

RESULTS

This Longitudinal Observational community based study among DOTS providers was conducted in field practice areas of PHC, Farukhnagar, Gurugram, Haryana. This study was conducted over a period of around 12 months (from December 2017 to November 2018). There were total of 39 DOTS providers which were interviewed.

Table 1: Age distribution of DOTS Providers

Age	No.	Percentage
20-30	04	10.25%
31-40	25	64.10%
41-50	08	20.51%
>50	02	5.12%

Total	39	100%
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Majority 64% Dots provider were in the age group of 31 – 40 years, 20.51% in 41 – 50 years, 10.25% in 20 – 30 years. Only 5.12% were above 50 years of age.

Table 2: Gender wise distribution of DOTS providers

Gender	No.	Percentage
Male	02	5.13%
Female	37	94.87%
Total	39	100%

About 94.87% DOTS provider were females and only 02 i.e. 5.13% were males.

Table 3: Distribution of DOTS Providers according to level of education

Education	No.	Percentage
Upto 8 th Std	10	25.64%
Above 8 th Std	29	74.35%
Total	39	100%

Majority i.e. 74.35% DOTS Providers were educated above 8th standard and only 25.64% DOTS provider were educated upto 8th standard.

Table 4: Distribution of DOTS Providers according to duration of job

Duration of job	No.	Percentage
Less than 5years	03	7.69%
More than 5years	36	92.30%
Total	39	100%

Table 4 shows the duration of job distribution of dots provider. About 92.30% of DOTS provider had experience of more than 5 years and only 3 i.e. 7.69% had experience of less than 5 years.

Table 5: Distribution of DOTS Provider according to type of service

Type of provider	No.	Percentage
ASHA	34	87.18%
ANM	03	7.69%
Multipurpose worker	02	5.13%
Total	39	100%

Majority of the DOTS provider were ASHA workers i.e. 87.18% and rest were ANM i.e. 7.69% and multipurpose worker i.e. 5.31%.

Table 6: Distribution of TB patients according to category

Category of patients	No.	Percentage
Category I	98	75.38%

Category II	25	19.23%
Multidrug resistant	03	2.31%
Defaulter	04	3.08%
Total	130	100%

Maximum number of TB patients was in category 1 i.e.75.38% and about 19.23% of patients were in category 2. Only 3.08% patients were defaulters. Rest 2.31% of patients were multidrug resistant patients.

Table 7: Performance of DOTS Providers as per performance indicators

Performance Indicators	Yes (No.)	Percentage
Initial Address Verification By DOTS Provider.	39	100%
Ensure That Every Treatment Card is Given A TB Number.	11	28.21%
Each And Every Patient Diagnosed As A Case Of Tuberculosis Has Started The Treatment Within 7 Days Of The Diagnosis	38	97.44%
Contacts Of Sputum Positive Cases Been Examined And The Results Been Recorded In The Treatment Card	20	51.28%
Fixed The Time And Place For DOTS Keeping In View The Patient's Convenience And Operational Feasibility	33	84.62%
Ensured That All Doses In Intensive Phase (IP) And The 1 st Dose Of Each Weekly Blister During Continuation Phase (CP) Are Taken Under Their Observation And Side By Side Ensure Collection Of Empty Blisters In Continuation Phase?	35	89.74%
Timely Examination Of Sputum At Defined Intervals	22	56.41%
Maintain A Treatment Card And Update The Original Card At Primary Health Institution (PHI) On Fortnightly Basis	33	84.62%
Retrieval Actions For Defaulter Patients	35	89.74%
Partially Used Patient Wise Boxes (PWB's) Are Returned To PHI Within A Month Of Such Event	38	97.44%

Table 7 shows the performance of DOTS providers. The questions were asked to assess the performance of DOTS provider according to guidelines of RNTCP. It was found that initial address verification was done by 100% providers. Only 28.21% of DOTS provider had provided a T B number in treatment card. 97.44% had ensured that treatment of patients started within 7 days of diagnosis. 51.28% providers had ensured that contacts of sputum positive cases were examined. 84.62% had ensured the maintenance of treatment card on fortnightly basis and fixed the time and place for DOTS.89.74% had taken retrieval action for defaulter patients and ensured the collection of empty blisters in Continuation phase. Only 56.41%were aware of timely examination of sputum at defined intervals.97.44% ensured that patient wise boxes are returned to PHI within a month of such event.

Table 8: Distribution of DOTS providers according to performance score

Performance Score	Score	Count	Percentage
Poor	<12	0	0.00%
Average	12-16	19	48.72%
Good	17-20	20	51.28%
TOTAL		39	100%

About 51.28% performance was good and 48.72% performance of DOTS provider was average.

Table 9: Onsite observation of DOTS Centre (32 DOTS Centre)

Observations	No.	Percentage
Satisfied with behaviour of DOTS provider	24	75%
Availability of clean water disposable cups	22	68.75%
Privacy at DOTS centre	19	59.37%
Waiting time at DOTS centre <10mins	20	62.5%

The Onsite observation of DOTS centre was done to ensure availability of logistics, drug supply and appropriate services at the centres. It was observed that only 68.75% had clean water and disposable cups. Privacy was maintained while drug dispensing and counselling at only 59.37% of centres. It was found in 62.5% of DOTS centre, patients waited for less than 10 minutes. However on observation, 75% of the DOTS provider had satisfactory behaviour.

Table 10: Awareness of DOTS provider regarding cause of Tuberculosis

Cause of TB	Number	Percentage
TB germs	18	46.15%
Addiction	12	30.76%
Poor hygiene	10	25.64%
Lack of food	6	15.38%
Over work	2	5.12%
Worries	3	7.69%
Don't know	12	30.76%

It was observed that 46.15% knew that T B is caused by germs. Only 30.76% thought that addiction was the cause of T B. It was found that 25.64% that T B is caused due to poor hygiene. Many of them 30.76% didn't even know the cause of T B. Few of them 15.38% thought that lack of food was cause of T B. Some thought that worries 7.69% was cause of TB. However few believed that overwork 5.12% was the cause of T B.

Table 11: Awareness of DOTS provider regarding diagnostic test available for tuberculosis

Diagnostic Tests	Count	Percentage
X ray	28	71.79%
Sputum microscopy	30	76.92%
Blood test	17	43.78%

Urine test	6	15.3%
Mantoux test	2	5.12%
Don't know	10	25.64%

Table 11 shows the knowledge of DOTS provider regarding the diagnostic tests available for T B. It was observed that 76.92% providers were aware that sputum microscopy is the diagnostic test for T B .71.79% were aware that X-RAY is a diagnostic test .However 43.78% considered that T B is diagnosed by blood test.15.3% said urine test &5.12% said T B diagnosis is done by mantoux test.25.64% DOTS provider didn't know the test used for T B diagnosis.

Table 12 Awareness of DOTS provider regarding suspects of Tuberculosis

Symptoms	No.	Percentage
Cough >2 weeks	28	71.79%
Weight loss	30	76.92%
Evening rise of temperature	16	41.02%
Night sweats	12	30.76%
Loss of appetite	26	66.66%
Chest pain	15	38.46%
Coughing out of blood	19	48.71%

Table 12 shows the knowledge of DOTS provider regarding suspects of T B. It was observed that 76.92% were aware that weight loss as symptom of T B. Many of them believe that 71.79% cough more than 2 weeks as the suspected symptom of T B. Many 66.66% believe that loss of appetite , 48.71% coughing out of blood as the suspected symptom of TB. Most 41.02% believe that evening rise of temperature as the suspected symptom of T B. Few 38.46% believe that chest pain as the suspected symptom of T B.30.76% believe that suspected symptom of T B are night sweats.

Table 13: Awareness of DOTS provider regarding treatment period of Tuberculosis

Treatment Period	Counts	Percentage
<6 Months	1	2.56%
6-9 Months	28	71.79%
>9 Months	6	15.38%
Don't know	8	20.51%

Table 13 shows the knowledge of DOTS provider regarding treatment of T B. It was observed that 71.79% were aware about the treatment period of T B is duration of 6-9months. 20.51% of DOTS providers don't even know the treatment period of T B. Few 15.38% thought that treatment period of T B is more than 9 months. Some 2.56% thought that treatment period of T B is less than 6 months.

DISCUSSION

Despite the existence of NTCP since 1962, tuberculosis remains the leading infectious cause of death in India. Around 2.2 million people are detected to have tuberculosis every year (25% of the global cases) and over 0.5 million die of this disease every year (17% of global TB deaths). Total population suffering from active disease in India is 14 million of which 3 to 3.5 million are positive for sputum (20% to 25% of total). About one million sputum-positive cases are added every year.

The study was conducted in PHC Farukhnagar of district Gurugram of Haryana state. The study area included all the DOTS centre covered under the PHC and capturing information pertaining to DOTS providers and the treatment outcome of the patients. The information is very pertinent as it would directly align to the performance of DOTS providers with the treatment outcome and ultimately leading to decreasing the burden of the disease. The quality and effective coverage of TB treatment is very much pivotal in meeting the ambitious goal declared by the Prime minister of India Mr Narendra Modi to end TB by 2025, five years ahead of the SDG goal of ending TB epidemic by 2030.

Socio Demographic Patients

It was observed that the socio demographic profile of all the DOTS providers in the present was reasonably good, thus an important determinant of quality services delivery. In the present study the DOTS services were predominantly (87 %) provided by ASHA workers. Most of the DOTS providers were females and 64 % of all DOTS provider belonged to the age group of 31-40 years. All DOTS providers have attained at least secondary level of education and had work experience more than five years whereas in a study by Gupta S et.al.³ A majority of the studied DOTS centers (56.7%) were being operated by non-government agencies as 31.7% DOT centers were being operated by NGO/volunteers and 25.0% by private practitioners indicating, an active community participation.

In our study majority of the DOT providers were female (94.87%) and male DOTS providers were only comprise of 5.13 % of the total DOT providers (Table 2). 64% of the total DOTS providers were aged between 31-40 years, 20.15% were in the age between 41-50 and more than 50 years DOTS providers were only 5.12% (Table 1). 74.35% of DOT providers got their schooling above 8th standard while 25.64% had their education up to middle school (Table 3).

In a study by Nagpal M et.al.⁴, The age wise distribution showed that 94.8% cases are from 15-59 years age group and only 5.2% are 60 years or above.

In the study conducted by Bhawnani D et.al.⁷ and his associates they found majority (83.8%) of the DOT providers were female and 50% were aged between 30-40 years. Jain M⁵ and his associates observed that 45.1% of DOT providers were educated up to > 12th level. In study by Manisha et al ASHAs were literate and completed educations up to primary level. More than three fourth of ASHAs (79.07%) had education from 8th class to post graduate level. Bhawnani D⁷ and his associates observed in their study that 26.5% of DOT providers got their schooling till higher secondary level while 25.7% had their education up to middle school.

In a study by Kanungo S et al⁹ the majority (85.7%) of these DOT providers were found in the age group of 30 to 60 years. Male DOT providers were found around 61.9%. Almost three fifth (59.5%) of DOT providers were from rural area. Around three fourth (73.8%) were

Hindus. In a study by Kaur A et.al⁶, Out of 50 DOT providers 37 (74%) were females and 13 (26%) were males.

Type of service/job profile of the DOTS providers

In our study, Majority of the DOTS provider were ASHA workers i.e. 87.18% and rest were ANM i.e. 7.69% and multipurpose worker i.e. 5.31%.

As per a study by Kanungo S et.al.⁹, More than two fifth (45.2%) DOT providers were non registeredpracticioners or quacks without any professional degree while one-third of them was Accredited Social Health Activist. Around one tenth i.e. 9.5% were AYUSH(Ayurvedic, yoga, siddha and homeopathy) practitioners.

Majority of workers were quite experience (92.30%) and there had been the job DOTS provider for more than 5 years (Table 4). Majority of workers (87.18%) were of ASHA (Accredited Social Health Activist), 7.69% worker were ANM and rest 5.13 % were multipurpose worker (Table 5).

Category of the patients

Out of the total 130 patients, 98 (75.38%) were of category I and 25 (19.23%) were of category II. The multidrug resistant and defaulter patients were 2.31% and 3.08% respectively (Table 6). Study conducted by Bhagyalaxmi² and her associates included only 35 patients in their study while Nagpal M⁴ and her associates conducted study on 219 patients.

Performance

In the instant study DOTS providers achieve 100% success when question of initial address verification arised. 97.44% DOTS worker also started Anti tubercular therapy within 7 days of diagnosis. Intensive phase treatment under observation and fixed time of dose of patients were also achieved quite remarkably (89.74% and 84.62 %).

In the instant study initial address verification was achieved 100% and treatment card with TB number was achieved in only 28.1% cases. In the study of Gupta S³, he found treatment cards were maintained in all the DOT centers but proper recording was found only in 86.6% centers. He also found treatment was being administered properly as per the category of patient in all the DOT centers but treatment was directly observed in 90.0%.

In a study by Nagpal M et.al.⁴, the address verification by the DOT provider was 80.4% and the availability of the DOT provider was 87.6% in the present study.

Behaviour of the DOTS Providers

In the instant study 75% of DOTS exhibited good behaviour toward patient. A study conducted by Gupta S³ showed only 12 (20.0) exhibited good behaviour as observed by the investigator, 40 (66.6) showed satisfactory response and eight (13.3) were found having rude behaviour indicating largely a low commitment of DOT providers towards the program.

In a study by Nagpal M et.al.⁴, Satisfaction with the behaviour of the DOT provider was observed in 239 (95.6%) cases.

Provision of Facilities and Required logistics at DOT Centres

As the direct observation of the treatment is the backbone of DOTS. In intensive phase swallowing of drugs in front of a DOT provider is the most important and crucial step ensures adequate intensive phase.

Availability of drinking water is first and foremost facility to be made available.

Although almost all of centers had adequate amount of drugs, syringes, and logistics as per findings from this study.

According to the programme guidelines,¹ is mandatory that patient should swallow drugs under the supervision of the DOT provider. Therefore, it is necessary that each DOT center should have drinking water facility, failing to which patient might not be observed by DOT provider.

Availability of clean cups and privacy at DOTS centre by and large were available.

In a study by Nagpal M et.al.⁴, availability of clean water, disposable cups and confidentiality which was just 63.2%,

In a study by Kanungo S et.al.⁹, storage facilities was available with 64.3% DOT centres. Drinking water facility was available only at 33.3% centers. Majority (83.3%) of DOT centers did not had sufficient stock of syringes and drugs.

In a study by Bhagat VM et.al.⁸, Drinking water facility was available only at 8 (61.54%) of the corporation DOT centers.

Effective counselling of patients, respectful behavior, providing timely drugs, ensuring regular follow ups are the few very important factors leading to good treatment outcomes. It was observed in the present study that all the DOTS providers were aware of signs and symptoms, drugs & diagnostics and the treatment of tuberculosis. A sound knowledge of these factors would help in better counselling and addressing the queries of patients. As the treatment cycle is lengthy and patience intensive, it is imperative that the patient is counselled well from time to time in order to avoid default and lead to desired outcome. This requires certain skill set which needs to be build and sensitized over a period of time to achieve the desired outcomes.

It was observed in the study that most of the DOTS providers adhered to the standards of service delivery like initial counselling of patients(100%), capturing TB numbers on card(100%),timely action for defaults(100%), however 97 % of the providers initiated treatment within 7 days of diagnosis, 95 % examined the contacts of sputum positive cases,90 % ensured timely treatment of patients,87 % ensured timely sputum examination and 97 % returned the partially used boxes to the facilities within one month. Some of the key performances like default cannot be directly attributed to the providers as certain parameters might be beyond the control of DOTS providers and it may not be right to link directly to the providers.

In a study by Bhagat VM et.al.⁸, 89.74% had taken retrieval action for defaulter patients and ensured the collection of empty blisters in Continuation phase

Performance of DOTS providers

In my study, Majority of DOTS providers fell in the category of Good (51.28%) and rest 48.72% were of average category whereas in a study by Gupta S³, one-fifth (20.0%) of the studied DOT provides were found performing poorly, while performance of 34 (56.7%) DOT providers was average. Only 12 (20%) and 2 (3.3%) were good and very good, respectively in their performance.

In a study by Kanungo S et.al.⁹, 21.4% of the TB patients ended with poor outcome while Among centres who had scored good, very minimal i.e only 11.3% poor outcome.

Knowledge and Awareness of DOTS providers

In our study majority of DOTS workers (46.15%) knew about the causative organism of tuberculosis. Surprisingly, 30.76% were aware of the factors that cause TB. They were also aware that drug addiction, poor hygiene and lack of food are other major factors (Table 11). Majority of DOTS providers were known of the fact that that cough of more than 2 weeks and weight loss are the predominant symptoms of TB (Table 12).

In the study of Gupta S³, he observed that all the DOT providers knew that cough of more than three weeks; weight loss and tiredness were the symptoms suggestive of tuberculosis. He also observed that symptoms such as evening rise of temperature, loss of appetite, chest pain, night sweats, shortness of breaths and coughing out of blood were known to 78.3%, 63.3%, 53.3%, 36.7%, 35.0 and 33.3%, DOTS providers respectively. Jain M⁵ and his associates observed in their study that majority more than three half i.e. 80.4% DOTS providers knew about the essential facts that TB is caused by bacteria. Few other questions like answered either virus, animal or do not know. Jain M⁵ also observed cough or breath was considered rightly the route of TB transmission by 98.1% providers.

In a study by Bhawnani D et.al,⁷ majority (55.15%) of DOT providers had average knowledge score.

In a study by Jain M⁵, on enquiring about correct knowledge of case definition of default, relapse and failure, the knowledge for the same was observed in 45.5%, 34.3%, 20.6 % DOTS Providers respectively. Around more than three fourth i.e. 80.4 % provide drugs during home visit. According to Jain M et.al⁵. in their study knowledge of DOTS providers about the disease was not found. Knowledge and awareness improved with higher qualification.

When it comes to awareness about the management of TB, 71.79% of total DOTS providers were aware that 6-9 months is period when anti tubercular drugs must be administered and 20.51% were not aware of the TB treatment at all.

In a study by Kaur A et.al⁶ knowledge about treatment schedule between trained & untrained DOT Providers was found to be highly significant.

Success Rate

A success rate of 92 % was observed in the study which is higher than the global and national average as per the global TB report of 2017. Only 2 % of the TB patient died, 5 % defaulted and the treatment failed in 1 % of the patients. The outcome of the MDR TB patients was not good as two out of three Patients of MDR TB died. The statistics observed were very good and can be attributed to many factors like the quality and attitude of DOTS providers, robust monitoring mechanisms among others.

Education and training status of the DOTS providers as well as awareness of the patients as well as wide reach of electronic media being in close proximity to Gurgaon may be a significant reason for the same.

There have been many national and international studies undertaken in the past to measure performance of providers and treatment outcomes of patients. Most of the results align with the better inputs to output & outcome variables like better access to rapid diagnosis, treatment and care will result in effective coverage and better outcome which will finally lead to decreasing the disease burden.

This study is another effort in the area of generating evidence to inform Policy makers and planners for the effective implementation of the ongoing TB programme.

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