

# Tuberculosis patients currently undertaking treatment at district tuberculosis centre in Kishanganj, Bihar

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## Abstract

**Background:** Tuberculosis is considered as one of the major public health problem. It is the 9<sup>th</sup> leading cause of death worldwide and the leading cause from a single infectious agent raking above HIV/AIDS. Correct knowledge and positive perception of community especially the patients suffering from TB towards this disease is therefore an essential prerequisite for early treatment seeking behaviour. We want to know about the attitude and practice of patients suffering from tuberculosis regarding the treatment of the disease. **Methods:** The study design was a community-based cross-sectional and the data was collected using questionnaire administer. Patients aging between 15 to 60 years, who were attending and undertaking the treatment under the tuberculosis centre in Kishanganj, were included as study population. The current study was carried out in Kishanganj district, between Jan 2017 to Dec 2018. Kishanganj is geographically and historically part of the Koch Rajbanshi culture. The native people of the district were locally called Surjapuri on the basis of a place named Surjapur in Uttar Dinajpur/Bangladesh. **Results:** In our study, Out of 460 respondents studied 73.00% were males and 27.00% were females, out of which it was observed that the prevalence of TB amongst the study subjects was highest 32.70% in the age group of 15-20years in male followed by 10.20% in the same age group in females. In the present study the history of alcohol use was present in 43.8% of study subjects. According to the health care facilities approached for treatment found from PHC -32%, from DTC-5%, and maximum number of cases approached form Govt dispensary i.e 34%. 91% Patients who had successful treatment of TB. **Conclusion:** The present study highlights the lack of awareness among the rural patients even though they receive the treatment from DOTS provider.

**Key Word:** Tuberculosis.

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## INTRODUCTION

Tuberculosis is an infectious disease that usually affects the lungs. Compared with other diseases caused by a single infectious agent, tuberculosis is the second biggest killer, globally. It is the 9<sup>th</sup> leading causes of death worldwide. In

2016 there were estimated 1.3 million TB deaths among HIV negative people. 1.4 million people fell ill with TB in 2016. The 18<sup>th</sup> and 19<sup>th</sup> centuries, a tuberculosis epidemic rampaged throughout Europe and North America, before the German microbiologist Robert Koch discovered the microbial causes of tuberculosis in 1882. However, in the mid-1980s, TB cases began to rise worldwide, so much so, that in 1993, the World Health Organization (WHO) declared that TB was a global emergency.<sup>[1]</sup>

### Type of tuberculosis:<sup>1,2</sup>

**Active TB:** The bacteria do cause symptoms and can be transmitted to others. Tuberculosis (TB) is a disease caused by a germ called *Mycobacterium tuberculosis* that is spread from person to person through the air. TB usually affects the lungs, but it can also affect other parts of the

body, such as the brain, the kidneys, or the spine. When a person with infectious TB coughs or sneezes, droplet nuclei containing *M. tuberculosis* are expelled into the air. If another person inhales air containing these droplet nuclei, he or she may become infected. However, not everyone infected with TB bacteria becomes sick. However, inhaling the germ does not mean you will develop active disease. A person's natural body defenses are often able to control the infection so that it does not cause disease. In this case, the person would be infected, but does not have active disease. Only about 10% of those infected will develop TB in their lifetimes. Active disease can occur in an infected person when the body's resistance is low or if there is a large or prolonged exposure to the germs that overcome the body's natural defenses. The body's response to active TB infection produces inflammation that can damage the lungs. The amount of damage may be quite extensive even though the symptoms may be minimal. Tuberculosis (TB) may be regarded in two categories: active disease or latent infection. The most common form of active TB is lung disease, but it may invade other organs, so-called "extrapulmonary TB."<sup>3</sup>

**Active TB:**

Active TB is an illness in which the TB bacteria are rapidly multiplying and invading different organs of the body. The typical symptoms of active TB variably include cough, phlegm, chest pain, weakness, weight loss, fever, chills and sweating at night. A person with active pulmonary TB disease may spread TB to others by airborne transmission of infectious particles coughed into the air.

The deadly synergy between mycobacterium tuberculosis and Human immune deficiency virus has resulted in a resurgence of tuberculosis world over <sup>7,8</sup>. HIV infected patients; there is 50% chance of developing active TB whereas in healthy individuals there is only 10% chance of active disease after infection with mycobacterium tuberculosis. Multi-drug treatment is employed to treat active TB disease. Depending on state or local public health regulations, and also as per National Health Programme in respect of tuberculosis, anti TB drugs to be started under the supervision of physician or other healthcare professional. This therapy is called "DOTS" (Directly Observed Treatment Short –Courses) and is

designed to prevent abandonment or erratic treatment, which may result in "failure" with continued risk of transmission or acquired resistance of the bacteria to the medications, including the infamous multi-drug resistant TB (MDR-TB).

**Latent TB:** Latent tuberculosis infection (LTBI) is a state of persistent immune response to stimulation by mycobacterium tuberculosis antigens without evidence of clinically manifested active TB. Someone has latent TB if they are infected with the TB bacteria but do not have signs of active TB disease and do not feel ill. However, they can develop active TB disease in future. About one-third of the world's population is believed to have latent TB. There is a 10 percent chance of latent TB becoming active, but this risk is much higher in people who have compromised immune systems, i.e., people living with HIV or malnutrition, or people who smoke, lead unhealthy lifestyle including environmental factors. TB affects all age groups and all parts of the world. However, the disease mostly affects young adults and people living in developing countries. In 2012, 80 percent of reported TB cases occurred in just 22 countries.

**Socio Demographic Features of Kishanganj:**

According to the 2011 census Kishanganj district has a population of 1,690,948, <sup>[4]</sup>. This gives it a ranking of 293rd in India (out of a total of 640).<sup>4</sup> The district has a population density of 898 inhabitants per square kilometre (2,330/sq mi)<sup>4</sup> Its population growth rate over the decade 2001-2011 was 30.44%.<sup>[4]</sup> Kishanganj has a sex ratio of 946 females for every 1,000 males,<sup>[4]</sup> and a literacy rate of 57.04%.<sup>4</sup> A vast majority of the people live in the villages. A predominantly Muslim area, with about 70 per cent of the population,<sup>[4]</sup> there are also Hindus of whom are Surajpuris(Rajbanshi). There also are small Santal pockets.<sup>5,6</sup> The inhabitants of Kishanganj mostly speak Surajpuri, one of the Rajbongshi languages which has many similarities with Bengali. Kishanganj district had a literacy rate of 55.46 per cent in 2011 census. The literacy rate of Bihar at 47.53 per cent is amongst the lowest in India, which has a literacy rate of 64.84 per cent. Amongst this the male literacy rate in Kishanganj district stood at 42.8 per cent, while the female literacy was 18.49 per cent which was one of the lowest in India.<sup>6,7</sup>

In Kishanganj	
Religion	Percent
Hindus	31%
Muslims	68%
Others	1%

Kishanganj district occupies an area of 1,884 square kilometres (727 sq mi),<sup>8,9</sup> It is surrounded by Araria district in the west, Purnia district in the south-west, Uttar Dinajpur district of West Bengal on the east,

and Darjeeling district of West Bengal and Nepal on the north. A narrow strip of West Bengal, about 20 km wide separates it from Bangladesh.<sup>10</sup> This district is located between 25° 20' and 26° 30' north latitudes, and 87° 7' and

88° 19' east longitudes.<sup>11</sup> Major rivers flowing through the district are Mahananda, Kankai, Mechi, Donk, Ratua and Ramzan Sudhani.<sup>11</sup>

## METHODOLOGY

The current study was carried out in Kishanganj district, between Sep 2016 to Oct 2018. Kishanganj is geographically and historically part of the Koch Rajbanshi culture. The native people of the district were locally called Surjapuri on the basis of a place named Surjapur in Uttar Dinajpur/Bangladesh. Geographically and culturally part of north-east India Kishanganj is known for its rain and humid climate. A vast majority of the people live in the villages. According to the 2011 census Kishanganj district has a population of 1,690,948. Its population growth rate over the decade 2001-2011 was 30.44%. Kishanganj has a sex ratio of 946 females for every 1,000 males, and a literacy rate of 57.04%. A predominantly Muslim area, with about 70 % of the population, there are also Hindus of whom are Surajpuris. There also are small Santal pockets. The inhabitants of Kishanganj mostly speak Surajpuri, one of the Rajbongshi languages which have many similarities with Bengali. Kishanganj district had a literacy rate of 55.46 per cent in 2011 census. The literacy rate of Bihar at 47.53 per cent is amongst the lowest in India, which has a literacy rate of 64.84 per cent. Amongst this the male literacy rate in Kishanganj district stood at 42.8 per cent, while the female literacy was 18.49 per cent which was one of the lowest in India.

### Study design:

The study design was a community-based cross-sectional and the data was collected using questionnaire administer.

### Study Population:

Patients aging between 15 to 60 years, who were attending and undertaking the treatment under the tuberculosis centre in Kishanganj, were included as study population .

### Sample Size:

Considering the prevalence of tuberculosis to be 30% the sample size was calculated using formula

$$\text{Sample Size} = 4pq / L^2$$

Where, **P = Anticipated prevalence**

$$q = 1 - p,$$

**L = allowable error which is taken as**

**15% of p in the study i.e.**

After calculation we got the sample size of 840 patients, who were suffering from tuberculosis. The subjects were selected by purposive sampling after explaining the aims and objectives of the study.

Certain inclusion and exclusion criteria were followed to select the study subjects for data collection.

### Inclusion Criteria:

- Patients within 15 – 60 years of age.
- Willingness to respond after explaining the aim of the study.
- Emotionally stable patients.
- Having history and or presenting complaints of cough for three weeks or more in duration .
- Already diagnosed cases of Pulmonary Tuberculosis included either as ‘defaults’, ‘relapsed’ ‘failure’, ‘not completed treatment’ or ‘chronic’ cases and undergoing treatment either from any Category of DOTS regimen , comprised the study subjects.

### Exclusion Criteria:

- Individuals less than 15 years of age.
- Individuals more than 60 years of age.
- Those patients who were cured or had already completed their treatment regimen with negative smears at the end of the treatment by either DOTS or non-DOTS regimen were excluded from the study.

### Tools of study:

1. Predesigned and pre-tested questionnaire
2. Clinical assessment of pulmonary tuberculosis.
3. Sputum examination for AFB

### Investigations:

The main tools for diagnosing pulmonary TB in the present study were sputum smear microscopy, chest x-ray and Sputum smear microscopy is the primary tool for diagnosing TB as it is more specific and has less inter-reader variability than x-ray .

Three sputum samples were collected over two consecutive days:

- Spot sample on the first day
- One early morning sample on second day and
- One spot sample on second day

Three (3) sputum specimens (spot-morning-spot) were properly labeled and it was ensured that the amount of sputum was adequate (not less than 2 ml) and sputum specimens were transported within a week to Department of Microbiology of M.G.M. Medical College and L.S.K. Hospital Kishanganj, Bihar.

Respondents have history of risk behaviour/risk situations and either having symptoms suggestive of pulmonary tuberculosis or already diagnosed as Pulmonary Tuberculosis cases, were counseled and motivated to report and seek counseling from Integrated Counseling and Testing Centre (ICTC)

## RESULTS

**Table 1:** Distribution of study subject according to Age and Sex

Age	Male		Female		Total	
	No of Patients	(%)	No of Patients	(%)	No of Patients	(%)
15-20	150	32.7	47	10.2	197	42.9
21-30	113	24.5	40	8.7	153	33.3
31-40	51	11.0	26	5.8	77	16.8
41-50	13	2.9	6	1.3	19	4.1
51-60	09	1.9	5	1.0	14	2.9
<b>Total</b>	<b>336</b>	<b>73.0</b>	<b>124</b>	<b>27</b>	<b>460</b>	<b>100</b>

**Table 2:** Distribution of study subject according religion

Religion	No of Patients	Percentage
Hindu	80	17.3
Muslim	317	69.0
Santal	20	4.4
Others	43	9.3
<b>Total</b>	<b>460</b>	<b>100</b>

**Table 3:** Distribution of study subject according Living status

Living Status	No of Patients	Percentage
Rural	298	64.7
Urban	112	24.3
Semi Urban	50	11.0
<b>Total</b>	<b>460</b>	<b>100</b>

**Table 4:** Distribution of study subject according Smoking status

Smoking Status	No of Patients	Percentage
Smoker	253	55
Non smoker	207	45
<b>Total</b>	<b>460</b>	<b>100</b>

**Table 5:** Distribution of study subject on their knowledge about the body part affected in TB

Body part effected	No of Patients	Percentage
Lungs	110	24
Blood	147	32
Leg	9	02
Stomach	23	05
Brain	23	05
All parts	92	20
Don't know	56	12
<b>Total</b>	<b>460</b>	<b>100</b>

**Table 6:** Knowledge of study subject on transmission of TB

Transmission of TB	No of Patients	Percentage
From Tb patients through coughing	157	34.2
Smoking/ Alcoholism	103	22.4
Taking meal with TB patients	99	21.4
Sexual contact with Tb patients	67	14.6
Don't know	34	7.4
<b>Total</b>	<b>460</b>	<b>100</b>

**Table 7:** Distribution of subject according to their chief presenting complain

Chief Complain	No of Patients	Percentage
Cough > 3 weeks	349	76
Fever more than a month	239	52
Lack of energy	340	74
Loss of weight	354	77
Cough out of blood	92	20
Others(Pain in neck/Joint pain/ Ulcers	115	25

**Table 8:** Distribution of study subjects according to the health care facilities approached for treatment

Health care facilities approached for treatment	No of Patients	Percentage
P.H.C	147	32
D.T.C	23	05
Govt dispensary	156	34
Ayush	5	01
Private Practitioners	37	08
Temple/Masque/ Jadoo tona	92	20
<b>Total</b>	<b>460</b>	<b>100</b>

**Table 9:** Distribution of study subjects on the basis of the investigations undergone by the respondents for diagnosis

Diagnosis	No of Patients	Percentage
Sputum Microscopy	460	100
Sputum Microscopy + Blood + X-ray	409	88.3
Sputum Microscopy + Blood	147	32
Sputum Microscopy + X-ray	239	52
X-ray	10	2.2

**Table 10:** Distribution of respondents as per their practices to prevent transmission of TB to other

Practices to prevent transmission of TB to other.	No of Patients	Percentage
Take treatment regularly + completely	212	46
Cover mouth while coughing	18	04
Dispose sputum properly	37	08
Don't know	55	12
Stay isolated	138	30
<b>Total</b>	<b>460</b>	<b>100</b>

**Table 11:** Distribution of successful rate of treatment of TB

successful rate of treatment of TB	No of Patients	Percentage
Patients who had successful treatment	418	91
Patients who didn't successful treatment	42	09
<b>Total</b>	<b>460</b>	<b>100</b>

## DISCUSSION

The RNTCP was launched in 1997 but India is still among the top 5 countries with 56% of estimated cases as reported by the WHO GLOBAL TB REPORT 2017. The RNTCP formulated and adopted the internationally recommended DOTS strategy as the most systematic and cost effective approach to revitalize the TB control program in India. Since then the current control of TB depends mainly on case management, the earliest using the Directly Observed Treatment Short Course Chemotherapy (DOTS) Regimen. This study showed that TB is familiar to the general community in the current study area, as the majority (94.9%) of the study participants had indicated that they have heard of TB disease, which is similar to previous studies done among pastoral communities in the Shinile area<sup>12</sup> and middle and lower Awash valley of Afar region, Ethiopia<sup>13</sup>, where 92.8% and 95.6% of the study participants were aware of the disease, respectively. However, in accordance with earlier studies in Somali region<sup>14</sup> and southwest Ethiopia [31] as well as in Afar region<sup>[13]</sup>, Kenya<sup>[15]</sup>, and Pakistan<sup>[16]</sup>, the respondents had

limited information concerning bacteria as a causative agent of TB. Instead, most of them perceived mainly either cold air or smoking and chat chewing as the cause of TB, which is more or less similar with other studies<sup>13</sup>. Poor awareness regarding etiology of the disease may have a negative impact on patients' attitude towards health-seeking behavior and preventive methods as most people with such beliefs may not visit health facilities or they may consider various traditional alternatives. Based on the results of this study, the respondents had basic knowledge about the common signs/symptoms of TB and its modes of transmission, which agrees with previous studies in a rural community in southwest Ethiopia<sup>17</sup>, in northeast Ethiopia<sup>13</sup>, and also in Iran<sup>[18]</sup> and Philippines<sup>19</sup>. In this regard, it was reported that persistence cough for 2 or more weeks, coughing up sputum with blood, chest pain and weight loss were the common sign and symptom of TB. Through the air when a person with TB sneezes or coughs, and sharing cups with the patient were the common perceived modes of transmission in different studies<sup>20</sup>. The reported basic communities' knowledge about the symptoms and

transmission methods of TB has an important implication for the TB control program in the current study area in particular and also in the country in general in that it could reduce diagnosis and treatment delay, as well as the spread of the disease. In our study, Out of 460 respondents studied 73.00% were males and 27.00% were females, out of which it was observed that the prevalence of TB amongst the study subjects was highest 32.70% in the age group of 15-20years in male followed by 10.20% in the same age group in females. In a study conducted by Murry *et al.* also stated that TB affects the most productive age groups. While morbidity and mortality in any age group has significant social and economic costs, death in prime aged adults (economically productive age) who are parent and bread earners in most societies have a particularly enormous burden. Amongst these 69.00% of the study subjects were Muslims while Hindus contributed for 17.30%, Santals(4.40%) and others (9.30%). The maximum study subjects affected with this disease were amongst the rural population contributing to 64.70% while the urban and semi urban stood at 24.30% and 11.00% respectively. The study subjects mainly comprised of the following –Rickshaw pullers were 25.70% of the study group while others included hotel boys (19.70%),tea garden workers(17.30%), shopkeepers(11.30%),health workers(2.30%), govt. employees (1.40%).Most of the females(22.30%) in the study group were house wives. The other study findings also showed that the majority (53%) of the respondents were employed. However, most of them are general workers in the fishing sector, the hospitality and construction industries and security services. It is generally accepted that people with some form of income are less likely to suffer condition that can leading to exposure to TB infection, since TB largely affects the disadvantaged and dispossessed (Bastian *et al.*, 2007)<sup>21</sup>. In the present study the history of alcohol use was present in 43.8% of study subjects. In a similar study conducted by Rajeshwari *et al.*, it was observed that patient delay was greater if the patient was an alcoholic.<sup>22</sup> It shows that the people who consume alcohol have a greater risk of becoming infected with tuberculosis leading into active TB disease. In our study 60.00% respondents belonged to CATEGORY-1 while 27.00% belonged to CATEGORY-3. Rest of the study subjects belonged to CATEGORY-2-13.00%. In the present study it was observed that maximum number of the respondents (55.00%) cited health workers as their source of information about TB while 20.00% of the respondents were totally ignorant about this disease. The other source of information regarding TB were from TV/Radio(10.00%),followed by DOTS centre(8.00%),Private Practioners(5.00%) and IEC Material/Newspaper (2.00%). Adherence to the long course of TB treatment is a complex, dynamic

phenomenon with a wide range of factors impacting on treatment-taking behavior. Patients' adherence to their medication regimens was influenced by the interaction of a number of these factors. The findings of this review could help inform the development of patient-centered interventions and of interventions to address structural barriers to treatment adherence.<sup>23</sup> Similarly in this study, three different visits made to patient to know the factors influencing the treatment adherence. During the first visit the adherence was 100%. The commonest reason influencing adherence was (68.8%) the motivation from the hospital staff/ DOTS provider. During the second visit the commonest reason (50%) influencing adherence was self-motivation by the patient to cure the disease. The commonest reason for loosing adherence was the local migration for work (12.4%). Nabil *et al.* in their study, revealed that barriers to DOTS adherence stem from a multiple dimensions of sociocultural influences, leading to a clash between cultural and public systems as well as a gap between patient and provider's perspectives.<sup>24</sup> It was observed that 48.00% respondents believed that Jadoo Tonas were the major cause of TB while 18.00% believed that smoking and alcohol addiction resulted in TB. Other than that 15.00% had a feeling that they acquired this disease due to continuous contact with patients of TB.5.00% stated bad food and air as the source cause while the other 5.00% stated fomites as the major cause.2.00% of the respondents also stated that trauma could be a cause of TB. Rest 7.00% had no idea about the cause of this disease. In the present study it was observed that majority(32.00%) of the subjects believed that TB mainly affects the blood.24.00% of the respondents mentioned that TB infects the lungs while 20.00% of them believed that all the parts of the body are affected equally. 12.00% of the respondents were ignorant about the body part affected by tuberculosis. Similarly in their study Nabil *et al.* stated that the main reason for not completing the treatment was the impression of being cured. Several studies have reported feeling cured as the main reason for defaulting.<sup>24</sup> In this study, the knowledge level of study subjects was assessed for causation, symptoms, diagnosis, treatment and prevention of TB by using open ended questions. More than half (66%) had unsatisfactory knowledge on tuberculosis. 34% had satisfactory knowledge scores. Similarly in a study conducted by Wandwalo *et al.*, in Mwanza, Tanzania, also found that, only 30% of the study population had satisfactory knowledge.<sup>25</sup> According to the health care facilities approached for treatment found from PHC -32%, from DTC-5%, and maximum number of cases approached form Govt dispensary i.e 34%. 91% Patients who had successful treatment of TB.

## CONCLUSION

The present study highlights the lack of awareness among the rural areas patients even though they receive the treatment from DOTS provider.

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