

# A Descriptive Correlational Survey to Determine Pulmonary TB Patient's Attitude and Compliance towards Selected Components of National Tuberculosis Elimination Programme (NTEP) in National Institute of Tuberculosis & Respiratory Diseases (NITRD), New-Delhi

Babita Nautiyal<sup>1</sup>, Daisy Thomas<sup>2</sup>, Madhumita Dey<sup>3</sup>, Anita Rani Kansal<sup>4</sup>

<sup>1</sup>Registered Nurse, Registered Midwife, Masters in Nursing (Rajkumari Amrit Kaur College of Nursing, New-Delhi, India), Nursing Officer at present in Govt. of NCT of Delhi

Corresponding Author Email: [babitanautiyal13\[at\]gmail.com](mailto:babitanautiyal13[at]gmail.com)

<sup>2</sup>RN, RM, MN, PH. D, Principal (Rajkumari Amrit Kaur College of Nursing, New-Delhi, India)

<sup>3</sup>RN, RM, MN, Assistant Professor (Rajkumari Amrit Kaur College of Nursing, New-Delhi, India)

<sup>4</sup>RN, RM, MN, PH. D, Nursing Superintendent (National Institute of Tuberculosis & Respiratory Diseases, New-Delhi, India)

**Abstract:** *This study aims to determine the pulmonary-TB patient's attitude, compliance towards selected components of NTEP; investigating the relationship between attitude and compliance; the association of attitude, compliance with selected variables. Using the survey approach this research gathered data from 230 pulmonary-TB patient's (new, relapse case) registered under NTEP in 9 DOTS centres under NITRD via telephonic administration of 'Structured Interview Schedule' by purposively selected 18-60 years old. The demography revealed that the maximum number of samples were of 18-24 years, male, lower class, know about NTEP through health-staff, resides <1km. The study revealed a statistically significant enhancement in compliance score as the attitude score increases; both the attitude, compliance is dependent on variables- age, socio-economic status, source of information and both are independent of variables- sex, distance from health-facility. The study highlights towards selected components of NTEP includes 66% sample's <6 years old children were on prophylaxis; 48.3% samples are receiving Direct Benefit Transfer monthly on time; 13% samples experiencing vomiting, itching, nausea, body-ache. The literature supports that observed substantial delays in DBT (NIKSHAY POSHAN YOJANA) were inability in opening bank-accounts on-time, unavailability of ID proofs causing payment delays. Their children who live in villages can't be traced by treating centres. Further study can be reproduced in villages, determine delays, benefits of NIKSHAY.*

**Keywords:** Pulmonary-TB, NTEP, Prophylaxis, NIKSHAY, Direct benefit transfer

## 1. Introduction

Tuberculosis is a communicable disease. TB remains one of the top 10 causes of death worldwide. Each year millions of people continue to get affected by Tuberculosis. Globally, in the year 2019 the newly diagnosed and notified TB cases reported were 7.1 million people, 7 million in 2018 which is a large increase from 6.4 million in 2017. To this global increase the biggest contributors rank first & second worldwide were INDIA and INDONESIA, in terms of estimated incidence per year. The National TB Elimination Programme under the aegis of National Health Mission (NHM) ensures provision of free TB services and management of TB as per the standards of TB care. INDIA has achieved Millennium Development Goal & has geared up to achieve targets of TB under the sustainable development Goal by 2025, 5 years ahead of global timelines. Tuberculosis Mortality & incidence rates are decreasing, at about 3% & 2% respectively, each year. The Government of INDIA has launched the response for ending TB through a robust National Strategic Plan (NSP) 2017-25 of NTEP. In order to take up the challenges of making a TB free INDIA, the

Government of INDIA has laid down many key initiatives under the NSP, such as active case findings by expansion of services, patient centric strategies with multi-sectoral involvement, the newer diagnostic tools & universal drug susceptibility testing (DST), introducing the daily drug regimen and the newer drugs- Bedaquiline & Delamanid, expansion of the molecular diagnostic laboratories (CBNAAT/True Nat) to 3042+ laboratories in the country. Indian tuberculosis programme also made financial incentives available for local programs to distribute to cooperating providers, although these incentives were not always used. Tools available to NTEP, such as advanced molecular diagnostics, enhanced patient and adherence support systems, or newer drug regimens, still remain incompletely implemented and also lack of proper utilization by the TB patients due to non-compliance in the patients registered under NTEP.<sup>[1]</sup> So, in order to eliminate this disease burden from the country the compliance and attitude of the affected population need to be assessed and monitored, then only the laid down initiatives by the Government of INDIA and a vision of the Prime Minister for ending TB could be achieved by 2025.

Volume 13 Issue 5, May 2024

Fully Refereed | Open Access | Double Blind Peer Reviewed Journal

[www.ijsr.net](http://www.ijsr.net)

## 2. Methods/ Approach

**Research approach:** Considering the nature of the problem and in order to accomplish objectives of the study the quantitative research approach was found to be most appropriate.

**Research design:** For the present study a descriptive correlational survey design was adopted to determine the pulmonary TB patient's attitude and compliance towards the selected components of the National Tuberculosis Elimination Programme (NTEP).

**Variables under study:** For the present study, the variable factors determined are: age, sex, socio-economic status, source of information about NTEP, distance from health facility, attitude and compliance of the Pulmonary TB patients.

**Study setting:** The setting selected for the present study included the DOTS and Microscopy Centers under 'National Institute of Tuberculosis & Respiratory Diseases, New-Delhi'. 1) Mehrauli DOTS center 38 2) NITRD-DOTS Room 3) Tigri DOTS clinic 4) Khanpur DOTS clinic 5) Chattarpur DOTS center 6) Beri-Sarai DOTS center 7) Jonapur DOTS center 8) Fatehpur-Beri DOTS center 9) Safdurjung OPD DOTS center. The setting was selected primarily because of the availability of the required number of Pulmonary TB patients, feasibility of conducting the study, the investigator's familiarity with the setting and the anticipated working health staff co-operation in the successful conduction of the study.

**Target Population:** Pulmonary Tuberculosis patients (both new and relapse case) who are in the continuation phase of the treatment during the sample collection period and in the age group of 18-60 years registered under NTEP.

**Accessible Population:** Pulmonary Tuberculosis patients (both new and relapse case) who are in the continuation phase of the treatment during the sample collection period and in the age group of 18-60 years registered under NTEP in National Institute of TB & Respiratory Diseases, New-Delhi during the data collection period.

**Sampling-** For the present study the purposive sampling technique was used for selecting Pulmonary TB patients registered under NTEP. The sample of the study comprises of the Pulmonary Tuberculosis patients (both new and relapse case) who are in the continuation phase of the treatment during the sample collection period and in the age group of 18-60 years registered under NTEP in National Institute of TB & Respiratory Diseases, New-Delhi. Sample size is decided by the researcher against a background of cost, time, number of availabilities of the samples and size of the total population and purpose of the study. Sample size was determined statistically using "Cochran's sample size Formula" based on the prevalence of pulmonary tuberculosis in India and the sample size calculated was 159 for final study.

**Sample size for final study:** 230 pulmonary TB patients both new and relapse case registered under NTEP.

**Inclusion criteria:** Pulmonary TB patients who are willing to participate in the study, in the age group of 18-60 years, available during the conduction of study, able to understand Hindi language, who are in the continuation phase of the treatment during course of my study.

**Exclusion criteria:** Pulmonary TB patients who will not be available during the conduction of the study, not willing to participate, doesn't lies in the age group of 18-60 years, not able to understand Hindi language, who are not in the continuation phase of the treatment during course of my study.

**Data collection tool and techniques:** For the present study data collected for survey through interview technique. The style of interview adopted is the telephonic interviewing for better feasibility in collecting data from the larger number of samples. For interviewing one sample it took around 25-30 minutes and 12 to 13 patients were covered per day and it took 18 days (8/01/21- 25/01/21)

**Description of the tool:** A structured interview schedule was developed to find out the demographic data, attitude and the compliance of the pulmonary TB patients towards selected components of NTEP. The tool is divided into three sections- Section- 1 was developed to collect the demographic data mainly the age, sex, socio-economic status, source of information about NTEP, distance from health facility.

Section-2 is having a structured attitude 5- point LIKERT scale & was developed to gather information regarding the attitude of pulmonary TB patients towards selected components of NTEP.

Section-3 is having a structured compliance 5-point rating scale & was developed to gather information regarding the compliance of pulmonary TB patients towards selected components of NTEP.

**Validity of tool:** The 11 experts provided their opinions for the content validation were from the field of respiratory medicine, community health medicine, district TB officers, head of nursing services, medical-surgical nursing. The experts provided their opinion in the context of the relevance of the items, clarity, appropriateness of the content areas.

**Try out:** Try out for the structured interview schedule and attitude scale was done on 10 pulmonary TB patients in the month of November, 2020 at Chest Clinic, RTRM Hospital Jaffarpur, New-Delhi-110073.

**Reliability:** reliability established using Chronback-alpha where r value calculated comes to be 0.859 for attitude scale & r value calculated for compliance rating scale comes to be 0.817. Thus, tools were found reliable.

**Pilot study:** A pilot study was conducted from 09/11/2020 to 21/11/2020 at the Chest Clinic, RTRM Hospital Jaffarpur, New-Delhi-110073 after the formal administrative approval from the Principal, R.A.K. college of Nursing, New-Delhi-110024 and the Office of District TB Officer, Chest Clinic, RTRM Hospital Jaffarpur, New-Delhi-110073. The pilot study was found feasible according to the expectation of the investigator and the requirements of the study.

**Ethical clearance:** Administrative approval from the RAK college of Nursing authority, approval from the concern authority of the Office of District TB Officer, Chest Clinic, RTRM Hospital for pilot study. Confidentiality and anonymity were maintained throughout the study. Formal administrative approval was taken for the final study from the Medical Superintendent, National Institute of Tuberculosis and Respiratory Diseases (NITRD), New-Delhi after the necessary approval by the Research cell and the ethical committee, NITRD, New-Delhi.

### 3. Results

**Table-1** shows the frequency and percentage distribution of demographic characteristics of pulmonary TB patients. out of 230 pulmonary-TB patients 95(41.3%) were in age group of 18-24 years, 52(22.61%) in 25-34 years, 32(13.91%) in 35-44 years, 28(12.17%) in 45-54 years and 23(10%) in 55-60 years of age. Regarding the sex, out of 230 samples 126(54.98%) were male and 104(45.21%) were females and 0% transgenders. About socio-economic status, out of 230 samples 1(0.43%) lies in Upper (class-I), 7(3%) lies in upper middle (class-II), 81(35%) lies in lower middle (class- III), 38(17%) in upper lower (class- IV) and 103(45%) lies in lower (class-V) as per “Modified kuppuswamy scale, 2020”.<sup>[2]</sup> The majority of participants came to know about NTEP through health staff, 119(52%) and 46(20%) through mass-media, 48(21%) from family members and relatives, 6(3%) from working place, 11(5%) through friends. Regarding the distance from health facility, out of 230 participants 140(61%) resides <1km, 90(39%) lives 1-5km and 0% found in more than 5km distance.

**Table 1:** Frequency and percentage distribution of the demographic characteristics of 230 pulmonary-TB patients.

Sample characteristics	Frequency	%
<b>Age</b>		
1.1) 18-24 yrs.	95	41.3
1.2) 25-34 yrs.	52	22.61
1.3) 35-44 yrs.	32	13.91
1.4) 45-54 yrs.	28	12.17
1.5) 55-60 yrs.	23	10
<b>Sex</b>		
2.1) Male	126	54.98
2.2) Female	104	45.21
2.3) Transgender	0	0
<b>Socio-economic status:</b>		
3.1) upper (class- I)	1	0.43
3.2) upper middle (class- II)	7	3
3.3) lower middle (class- III)	81	35
3.4) upper lower (class- IV)	38	17
3.5) lower (class- V)	103	45
<b>Source of information about NTEP</b>		
4.1 From health staff		
4.2 Mass-media (TV, internet, newspaper etc.)	119	52
4.3 Family member and relatives	46	20
4.4 Working place	48	21
4.5 Friends	6	3
	11	5
<b>Distance of home from health facility:</b>		
5.1) < 1 km	140	61
5.2) 1 to 5 km	90	39
5.3) more than 5 km	0	0

The data presented in the **Table-2** indicates that the majority of pulmonary TB patients are having favourable attitude 133 (57.82%), followed by 93 (40.43%) having neutral attitude towards selected components of NTEP. Only 4 (1.74%) pulmonary TB patients are having positive attitude. None of the pulmonary TB patients are having unfavourable attitude and negative attitude towards the selected components of NTEP.

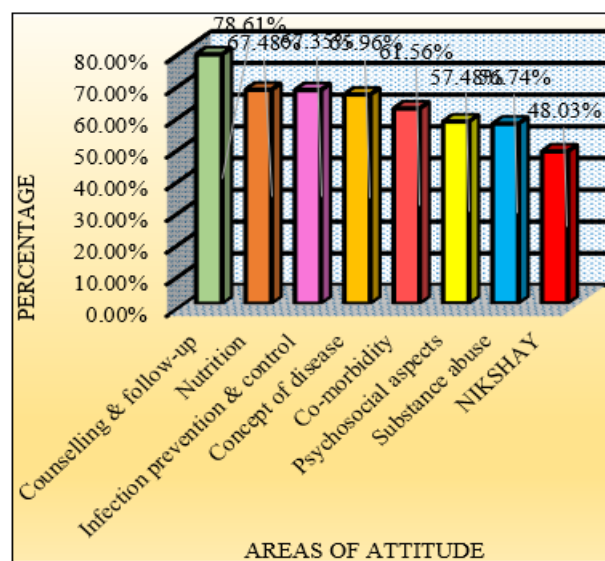
**Table 2:** Frequency and Percentage of the attitude scores of 230 pulmonary TB patients

Attitude	Frequency	Percentage
Positive	4	1.74
Favorable	133	57.82
Neutral	93	40.43
Unfavorable	0	0
Negative	0	0

The **table-3 and figure-1** shows the attitude areas of the pulmonary TB patients. The total number of items were 25 and the maximum score is 125. Among the mean scores of the attitude areas, the highest is 20.2 of the infection prevention & control whereas the lowest mean score is the 3.93 of the counselling and follow-up. The mean % of the area counselling & follow-up is the highest that is 78.61 % whereas the mean % of the area NIKSHAY is the lowest that is 48.03%.

**Table 3:** Area wise Mean score, Mean Percentage of attitude scores of 230 pulmonary TB patients

S. No.	Attitude Area	Total items	Max. score	Mean score	Mean %
1	Concept of disease	4	20	13.19	65.96 %
2	Psychosocial aspects	5	25	14.37	57.48 %
3	Infection prevention & control	6	30	20.20	67.35 %
4	Nutrition	2	10	6.75	67.48 %
5	Co-morbidity	2	10	6.16	61.56 %
6	Substance abuse	2	10	5.67	56.74 %
7	NIKSHAY	3	15	7.20	48.03 %
8	Counselling & follow-up	1	5	3.93	78.61 %
Total	25	125	77.47		



**Figure 1:** Bar diagram showing area wise mean percentage of the areas of attitude scores of the pulmonary TB patients towards selected components of NTEP.



The data presented in the **Table-4** indicates that the majority of pulmonary TB patients are having moderate compliance **139 (60.43%)**, followed by **89 (38.7%)** having fair compliance and **2 (0.86%)** found having inappropriate compliance towards selected components of NTEP. None of the pulmonary TB patients found having full compliance and non-compliance towards the selected components of NTEP.

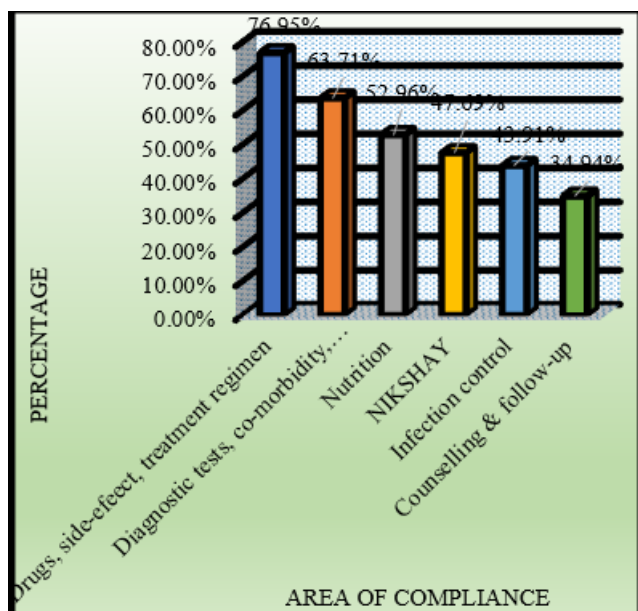
**Table 4:** Frequency and Percentage of the compliance scores of 230 pulmonary TB patients.

Category	Frequency	Percentage
Fully compliance	0	0
Fair compliance	89	38.69
Moderate compliance	139	60.43
Inappropriate compliance	2	0.86
Non-compliance	0	0

The **table-5** and **figure 2** shows the compliance areas of the 230 pulmonary TB patients. The total number of items were **35** and the maximum score is **140**. Among the mean scores of the compliance areas, the highest is **30.78** of the drugs, side-effect & treatment regimen, whereas the lowest mean score is the **5.58** of the counselling and follow-up. The mean % of the area counselling & follow-up is the lowest that is **34.94 %** whereas the mean % of the area drugs, side-effect & treatment regimen is the highest that is **76.95 %**.

**Table 5:** Area wise Mean score and Mean Percentage of compliance scores of 230 pulmonary TB patients

s.no.	Area	Total items	Max. score	Mean score	Mean %
1	Infection prevention & control	5	20	8.78	43.91%
2	Diagnostic tests, co-morbidity, substance abuse	8	32	20.38	63.71%
3	Nutrition	4	16	8.47	52.96%
4	NIKSHAY	4	16	7.63	47.69%
5	Drugs, side-effects, treatment regimen	10	40	30.78	76.95%
6	Counselling & follow-up	4	16	5.58	34.94%
Total		35	140	81.63	



**Figure 2:** Bar diagram showing area wise mean percentage

of the areas of compliance scores of the 230 pulmonary TB patients towards selected components of NTEP

The **table-6** shows that out of the 44 pulmonary TB patients who were having <6 years old child/children, only 29 (**66%**) pulmonary TB patient's child/children were having anti-TB prophylaxis whereas 15 (**34%**) pulmonary TB patient's child/children were not taking prophylaxis treatment for tuberculosis from their DOTS provider.

**Table 6:** Frequency & percentage distribution of the 44 pulmonary TB patients having <6 years old child/children

<6 years Child/Children at home	Frequency	Percentage
Taking prophylaxis	29	66 %
Not taking prophylaxis	15	34 %

**Table 7:** Frequency & percentage distribution of the 230 pulmonary TB patients getting DBT of Rupees 500/- month during the course of the treatment

Pulmonary TB patients receiving DBT of Rupees 500/month during treatment	Frequency	Percentage
Always	1	0.4 %
Mostly	111	48.3 %
Sometimes	116	50.4 %
Rarely	2	0.9 %

The above **table-7** depicts that the pulmonary TB patients who are receiving the DBT amount of rupees 500/month mostly are **48.3 %** only and only **0.4 %** patients receives the amount always in each month during treatment. Most of the patients **50.4 %** are sometimes receiving the amount on monthly basis and **0.9 %** rarely receives the DBT on monthly basis.

**Table 8:** Frequency & percentage distribution of the side effects of DOTS treatment as expressed by 230 pulmonary TB patients.

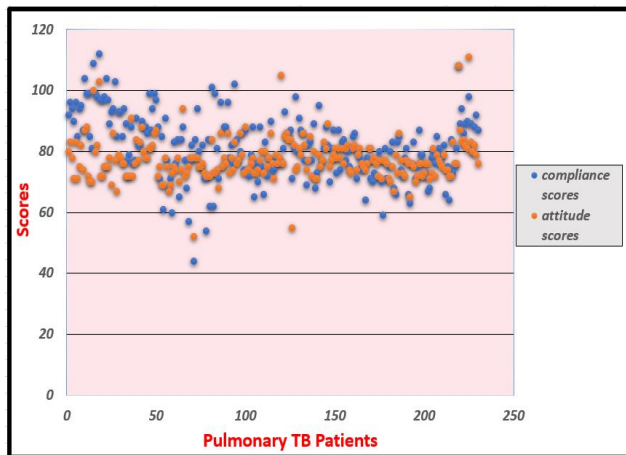
Side-effects of DOTS treatment	Frequency	Percentage
Nausea	12	5.2 %
Vomiting	30	13 %
Itching	22	9.5 %
Body-ache	4	1.7 %
No side-effect	162	70.4 %

**Table-8** shows that majority of the pulmonary TB patients 30(**13%**) had experienced vomiting as the side effects of DOTS treatment followed by itching 22(**9.5%**) then nausea 12(**5.2%**) and only 4(**1.7%**) expressed body-ache as the side-effects of DOTS treatment and 162(**70.4%**) were not having any side-effect. The data in **table-9** and **figure-3** shows that there was a **positive correlation** (0.54) between the attitude and compliance scores of the pulmonary TB patients which was found **statistically significant** at 0.05 level of significance. The positive correlation shows that as the attitude scores increase, it enhances the compliance scores.

**Table 9:** Karl Pearson co-efficient of correlation between attitude score and compliance score of the 230 pulmonary TB patients.

Variables	Mean	Standard deviation	"r" value
Attitude	77.5	6.8	<b>0.54*</b>
compliance	81.6	10.6	

\*Significant at 0.05 level of significance; df (228), r = 0.123



**Figure 3:** Scattered plot showing the relationship between attitude scores and compliance scores of the pulmonary TB patients.

The study revealed that the computed chi-value 18.732 of the attitude scores with the selected variables i.e. age is found significant ( $p < 0.05$ , df (8) chi-value = 15.51) at 0.05 level of significance. For sex the computed chi-square value 2.09 which is found non-significant ( $p > 0.05$ , df (2) chi-value = 5.09) at 0.05 level of significance. Regarding socio-economic status the computed chi-square value is 101.8 which is found significant ( $p < 0.05$ , df (8) chi-value = 15.51) at 0.05 level of significance. The computed chi-square value for source of information about NTEP is 19.93 which is found significant at 0.05 level of significance ( $p < 0.05$ , df (8) chi-value = 15.51). The attitude score with selected variable i.e. distance from health facility is found non-significant with computed chi-square value of 1.981 at 0.05 level of significance ( $p > 0.05$ , df (2) chi value = 5.99). Hence, the attitude is dependent on age, sex, source of information and the attitude is independent of sex and distance from health facility. The study found that the computed chi-value 23.21 of the compliance scores with the selected variables i.e. age is found significant ( $p < 0.05$ , df (8) chi-value = 15.51) at 0.05 level of significance. For sex the computed chi-square value 1.77 which is found non-significant ( $p > 0.05$ , df (2) chi-value = 5.99) at 0.05 level of significance. Regarding socio-economic status the computed chi-square value is 34.05 which is found significant ( $p < 0.05$ , df (8) chi-value = 15.51) at 0.05 level of significance. The computed chi-square value for source of information about NTEP is 37.17 which is found significant at 0.05 level of significance ( $p < 0.05$ , df (8) chi-value = 15.51). The compliance score with selected variable i.e. distance from health facility is found non-significant with computed chi-square value of 0.105 at 0.05 level of significance ( $p > 0.05$ , df (2) chi value = 5.99). Hence, the compliance is dependent on age, sex, source of information and the compliance is independent of sex and distance from health facility.

#### 4. Discussion

The findings of the present study have been discussed in terms of the objectives, theoretical bases and the hypothesis formulated and it revealed that the maximum number of samples were of 18-24 years, male, lower class, know about NTEP through health-staff, resides  $< 1$ km. The study revealed a statistically significant enhancement in compliance score as

the attitude score increases; both the attitude, compliance is dependent on variables- age, socio-economic status, source of information and both are independent of variables- sex, distance from health-facility. The study highlights towards selected components of NTEP includes 66% sample's  $< 6$  years old children were on prophylaxis; 48.3% samples are receiving Direct Benefit Transfer monthly on time; 13% samples experiencing vomiting, itching, nausea, body-ache.

The study finding is similar to the findings of **Kulkarni et al. (2013)** to which about 66.66 % of all the patients were in the age group of 20-49, 67.30 % were male and the majority of the patient belongs to the socio-economic status (class IV & V).<sup>[3]</sup> According to the **India TB Report (2019)** the characteristics of the affected population largely remain similar with majority of the affected individuals being in the age group of 15-69 years and 2/3<sup>rd</sup> males were affected.<sup>[4]</sup> There were 92.5% subjects belonging to poor income group as stated by **Bansal et al. (2018)**.<sup>[5]</sup> **Tasnim et al. (2012)** described in the study that in India doctors and health care workers were the source of the information regarding tuberculosis by 50.2% followed by mass media (33.8%), and (34.7%) mentioned interaction with others in the community.<sup>[6]</sup> Also similar to the findings of **Robsky et al. 2020** in which many patients lived  $< 2$  km from their chosen facility (34%).<sup>[7]</sup> A study conducted by **Rajeshwari et al. (2002)** illustrates that 42% of the patients lived within 2 km of a health facility.<sup>[8]</sup> The majority of pulmonary TB patients are having favourable attitude which is similar to the study by **Luba et al. (2019)** which stated that there were positive attitude in higher number of respondents for TB and also shows that sex, age, educational level, mass media exposure and occupation were strongly associated with respondent attitude towards TB.<sup>[9]</sup> A study conducted by **Rai et al. (2015)** stating that 80.11% complied with the treatment.<sup>[10]</sup> A study conducted by **Zainal et al. (2020)** revealed the outcomes that the Patients' perceptions about TB impacted significantly to TB patients' treatment.<sup>[11]</sup> The study findings of **Wahyuni et al. (2018)** shows that there was a relationship between attitude and adherence of TB treatment ( $p < 0.05$ ).<sup>[12]</sup> The majority of the pulmonary TB patients 13% had experienced vomiting as the side effects during the intensive phase of DOTS treatment which is similar to the finding of **Yang et al. (2017)** stated that the side effects observed most frequently included gastrointestinal disturbance (18.4%).<sup>[13]</sup> As per the study finding of **Patel et al. (2019)**, among 1826 patients, 42.2% had received at least one instalment of the DBT and 7.3% public sector patients had received first instalment within 2 months of treatment initiation and further stated that the challenges identified in implementation were the inability of patients to open bank accounts due to lack of identity/residence proof, their reluctance to share personal information and inadequate support from private providers.<sup>[14]</sup> The finding of **Nirgude et al. (2019)** stated that 49.9% received approvals for payment by PFMS and 28.7% got paid by 1 December 2018 (censor date). DBT coverage was low and there were substantial delays.<sup>[15]</sup>

#### 5. Conclusion

The literature supports the observations that the substantial delays in DBT (NIKSHAY POSHAN YOJANA) were inability in opening bank-accounts on-time, unavailability of ID proofs causing payment delays and got their first DBT

amount 2 or 3 months after starting their treatment. This study found that the labours or low-income group most of the time travel from one city to another in search of work and their children live in villages or their native place and majorly due to this reason their children can't be traced by the treating centres. Also, some of the patients travel back to their native places after completion of treatment and not found interested in giving sputum samples again or confirmation of successful treatment. Further study can be reproduced in villages, determine substantial delays, coverage and benefits of NIKSHAY.

## References

- [1] **Central TB Division.** India TB Report 2020. New Delhi, Nirman Bhawan: Directorate General of Health Services, Ministry of Health and Family Welfare; 2020.
- [2] **Saleem SM.** Modified Kuppaswamy Socioeconomic Scale updated for the year 2020. Indian J Forensic Community Med. 2020 Apr; 7(1).
- [3] **Kulkarni P, Akarte S, Mankeshwar R, Bhawalkar J, Banerjee A, Kulkarni A.** Non-Adherence of new pulmonary tuberculosis patients to anti-tuberculosis treatment. Ann Med Health Sci Res. 2013 Jan; 3(1): 67-74.
- [4] **Central TB Division.** India TB Report 2019. New Delhi, Nirman Bhawan: Directorate General of Health Services, Ministry of Health and Family Welfare; 2019.
- [5] **Bansal SK, et al.** Sociodemographic Distribution of Pulmonary Tuberculosis Amongst Patients: A Hospital based Study. International Journal of Contemporary Medicine, Surgery & Radiology. 2018 Jan-Mar; 3(1): 143-145.
- [6] **Tasnim S, Rahman A, Hoque FM.** Patient's Knowledge and Attitude towards Tuberculosis in an Urban Setting. Pulm Med. 2012; 2012: 352850.
- [7] **Robsky KO, Hughes S, Kityamuwesi A, Kendall EA, Kitonsa PJ, Dowdy DW, et al.** Is distance associated with tuberculosis treatment outcomes? A retrospective cohort study in Kampala, Uganda. BMS Infect Dis. 2020 Jun 11; 20(1): 406.
- [8] **Rajeswari R, Chandrasekaran V, Suhadev M, Sivasubramaniam S, Sudha G, Renu G.** Factors associated with patient and health system delays in the diagnosis of tuberculosis in South India. Int J Tuberc Lung Dis. 2002 Sep;6(9):789-95.
- [9] **Luba TR, Tang S, Liu Q, Gebremedhin SA, Kisasi MD, Feng Z.** Knowledge, attitude and associated factors towards tuberculosis in Lesotho: a population-based study. BMC infect Dis. 2019 Jan 29; 19(1): 96.
- [10] **Rai N, Kushwah SS, Singh SP, et al.** An assessment of treatment compliance among patients on DOTS under revised national tuberculosis control programme in district Rewa, Madhya Pradesh, India. Int J Community Med Public Health. 2015 Nov; 2(4): 373-379.
- [11] **Zainal S M, Sapor, Syafruddin, Irwandy.** The effect of patients' perception about tuberculosis (TB) against treatment compliance. Enfermeria Clinica. 2020 Mar;30 Suppl 2:416-419.
- [12] **Wahyuni AS, Soeroso NN, Wahyuni DD, Amelia R, Alona I.** Relationship of attitudes and perceptions with adherence in treatment of pulmonary tuberculosis patients in Median, Indonesia. Asian J Pharm Clin Res [Internet]. 2018 Apr.26 [cited 2021 Apr 2]; 11(13): 222-4. Available from: <https://innovareacademics.in/journals/index.php/ajpcr/article/view/26612>
- [13] **Yang TW, Park HO, Jang HN, Yang JH, Kim SH, Moon SH, et al.** Side effects associated with the treatment of multidrug-resistant tuberculosis at a tuberculosis referral hospital in South Korea: A retrospective study. Medicine (Baltimore). 2017 Jul; 96(28): e7482
- [14] **Patel BH, Jeyashree K, Chinnakali P, Vijayageetha M, Mehta KG, Modi B, et al.** Cash transfer scheme for people with tuberculosis treated by the National TB Programme in Western India: a mixed methods study. BMJ Open. 2019 12 29;9(12): e033158.
- [15] **Nirgude AS, Kumar AMV, Collins T, Naik PR, Parmar M, Tao L, et al.** 'I am on treatment since 5 months but I have not received any money': Coverage, delay and implementation challenges of 'Direct Benefit Transfer' for tuberculosis patients- a mixed- methods study from South India. Glob Health Action. 2019; 12(1): 1633725.