

# Prevalence and Factors Associated With Treatment Adherence among Tuberculosis Patients in Tiruvallur District, Tamil Nadu

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## ABSTRACT

The aim of this study is to assess the level of adherence to TB treatment and determine the factors contributing to non-adherence among patients with TB attending district TB centre and its sub centres in Tiruvallur district, Tamil Nadu. Thus we conclude that poor knowledge about the disease; treatment and adverse effects are the main problem that obstructs people from taking regular treatment.

**Key words:** Adherence, Tuberculosis, Pulmonary

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## INTRODUCTION

Tuberculosis (TB) is among the top ten causes of global mortality. It is estimated that approximately one-third of the world's population is infected with tuberculosis bacillus, and each year eight million people develop tuberculosis disease which annually kills 1.8 million worldwide many other interventions focus on educating patients with TB on knowledge regarding TB and its treatment so that they can take decisions with knowledge and helps in betterment of health care team to provide quality treatment without interruptions [1]. Online technologies like systems for reminder and tracking of patients with TB like reminder letters, phone calls, home visits, SMS services and electronic pill box are targeted on Patients with TB for improving adherence and undisturbed treatment completion [2]. Interventions like psychological counselling or social meetings for patients with TB are targeted which focuses on psychological aspects of patient and thus bettering the treatment adherence to TB treatment [3]. It is crucial to have a high focus on patients who have lost to follow up by the health care providers as it results in poor treatment outcome and also addressing the factors which leads to loss to follow up and improving the treatment adherence. Especially in resource limited setting [4]. Hence, this study was done to identify factors affecting the treatment adherence to TB

treatment and methods to reduce disease burden in Tiruvallur district.

## MATERIALS AND METHODS

### Study design

Hospital based cross sectional study.

### Study population

The cross sectional study was done in TB cases attending district tuberculosis centre and TB units for treatment using pre tested and structured questionnaire by interview method during the study period.

### Inclusion criteria

All adults aged above 18 years both male and female diagnosed as smear positive or smear negative or clinically diagnosed Pulmonary (PTB) and Extra Pulmonary (EPTB) and patients with TB who were residing in the district and registered for treatment and have been taking treatment for at least 2 months.

### Exclusion criteria

Those who died after starting the treatment, those who are transferred out during the treatment, those who have not completed treatment for at least 2 months and those who refuse to give consent.

**Methodology**

A list of all the tuberculosis units in Tiruvallur district was obtained from the district TB centre in Tiruvallur enclosed in Annexure. Two tuberculosis Units were selected randomly from the 14 tuberculosis units and the entire smear positive, smear negative and clinically diagnosed patients with TB who got enrolled for treatment in these 2 TB Units between January 2019 to June 2019 were used as the sampling frame.

**RESULTS**

Among the study population of 1800 patients with TB, 205 patients with TB who were registered we enrolled in the study (Table 1).

**Table 1: Socio demographic characteristics of the study population.**

S.NO	Socio demographic characteristics	Number (N=205)	Percentage (%)
1	Gender	Male	74.1
		Female	25.8
2	Age	18-40	22.4
		41-65	67.3
		>65	10.2
3	Educational Status	illiterate	3.9
		School education	68.2
		College education	24.3
		PG/professional	3.4
4	Occupation	professional	2.4
		clerical	15.1
		skilled	16.1
		unskilled	38.5
		unemployed	27.9
5	Religion	Hindu	59
		Muslim	27.8
		Christian	13.1
6	Socio-Economic status	I	2.4
		II	9.3
		III	13.7
		IV	36.1
		V	38.5
7	Marital status	Unmarried	16.1
		Married	79
		Widowed/divorced	4.9
8	Type of family	joint	30.7
		nuclear	69.3

Table 2 shows the adverse effects of the Anti-tuberculosis treatment among the study participants. Out of 205 participants 43.9% reported adverse effects after receiving anti-TB treatment and rest 56% had a good compliance for Anti-TB treatment. About 93.3% complained of colored urine followed by GIT disturbance

(80%), Peripheral neuropathy (25.5%), auditory effects/vertigo (16.6%), skin problems (20%), visual problems/Headache (14.4%) and Hepatitis (10%).

**Table 2: Adverse effect of anti-TB treatment among study population.**

Adverse effect	Number (n=205)	Percentage
Yes	90	43.9
No	115	56
Type of Adverse effect	Number (n=90)	Percentage
GIT disturbance	72	80
Colored urine	84	93.3
Hepatitis	9	10
Peripheral neuropathy	23	25.5
Visual problem/headache	13	14.4
Auditory effects/vertigo	15	16.6
Skin Problems	18	20

Table 3 shows significant association has been noted between prevalence of non-adherence to TB treatment and several socio demographic characters. Females are at a higher risk of being non adherent to TB treatment in comparison with males (OR-1.79, P-value 0.049). Non-adherence to TB treatment is more common in individuals more than 65 years and lowest in the age group of 18-40 years. This finding is statistically

significant (P-value 0.0009). Non-adherence to TB treatment is more common among illiterates and lowest among professionals. This finding is statistically significant (P-value 0.0019).

**Table 3: Association of treatment adherence with socio demographic variables.**

Socio demographic Variable	Total frequency	Adherence		P value	X <sup>2</sup>	OR	95% CI	
		Yes (139)	No (66)					
Gender	Female	53	31	22	0.049	2.29	1.74	0.91-3.33
	Male	152	108	44				
Age	18-40	46	36	10	0.0009	13.93	-	-
	41-65	138	96	42				
	>65	21	7	14				
Education	Illiterate	8	2	6	0.0019	14.9	-	-
	School Education	140	89	51				
	College education	50	42	8				
	Post graduate/ Professional	7	6	1				
Occupation	Professional	5	4	1	0	109.1	-	-
	Clerical	31	16	15				
	Skilled	33	20	13				
	Unskilled	79	55	24				
	Unemployed/ Retired	57	44	13				
Religion	Hindu	121	92	29	0.002	16.2	-	-
	Muslim	57	32	25				
	Christian	27	15	12				
Socioeconomic Status	I	5	0	5	0.002	16.2	-	-
	II	19	15	4				
	III	28	22	6				
	IV	74	56	18				
	V	79	41	38				
Marital Status	Unmarried	33	21	12	0.85	0.32	-	-
	Married	162	111	51				
	Widowed/ Divorced	10	7	3				
Type of family	Joint	63	41	22	0.28	0.3	1.19	0.63-2.23
	Nuclear	142	98	44				

Table 4 shows significant association has been noted between prevalence of non-adherence to TB treatment and selected diagnostic and treatment attributes Tuberculosis are a t higher risk of being non-adherent to TB treatment in comparison with extra pulmonary Tuberculosis. This finding is statistically significant (OR-4.16, P-value 0.01). Those participants who are diagnosed at private sector are at higher risk of being non adherent to TB treatment in comparison with those who are diagnosed at government sector. This finding is

statistically significant (OR-2.12, P-value 0.02). Those participants who had no family history of Tuberculosis are at higher risk of being non adherent to TB treatment in comparison with those who have family history of Tuberculosis. This finding is statistically significant (OR-7.90, P-value 0.000).

**Table 4: Association of treatment adherence with selected diagnostic and treatment attributes.**

Variable	Total frequency	Adherence		P value	X <sup>2</sup>	OR	95% CI	
		Yes (139)	NO (66)					
Type of TB	Pulmonary	179	116	63	0.01	5.82	4.16	1.20-14. 41
	Extrapulmonary	26	23	3				

Place of diagnosis	Private	51	28	23	0.02	5.17	2.12	1.10-4.07
	Government	154	111	43				
Family history	No	164	101	63	0	14.53	7.9	2.34-26.67
	Yes	41	38	3				
Place of treatment	Higher Centers	58	24	34	0	25.87	5.09	2.64-9.78
	PHCs	147	115	32				
Patient category	Category I	164	102	62	0.0003	11.82	5.62	1.91-16.53
	Category II	41	37	4				
No. of months of treatment completed	2 months	38	33	5	0	24.04	-	-
	3 months	51	43	8				
	4 months	72	38	34				
	5 months	36	19	17				
	>6 months	8	6	2				

Table 5 shows significant association between prevalence of non-adherence to TB treatment and adverse effects of anti-tubercular drugs. Participants experiencing side effects related to treatment are at higher risk of being non-adherent to TB treatment in comparison with those who do not develop side effects. This finding is statistically significant (OR-6.79, P-value 0.000). Those participants who develop colored urine are at higher risk of being non-adherent to TB treatment in comparison with those who do not develop colored urine. This

finding is statistically significant (OR-2.74, P-value 0.001). Those participants who develop tingling sensation of hands and legs are at higher risk of being non-adherent to TB treatment in comparison with those who do not develop tingling sensation of hands and legs. This finding is statistically significant (OR-8.32, P-value 0.000).

**Table 5: Association of Treatment adherence with adverse effects.**

Variable		Adherence			P value	X2	OR	95% CI
		Total frequency	Yes (139)	NO (66)				
Are you experiencing side effects related to treatment?	Yes	90	44	46	0	40.26	6.79	3.63-12.71
	No	150	130	20				
<b>Adverse effects</b>								
GIT Disturbance	Yes	72	28	44	0	42.5	7.92	4.10-15.31
	No	133	111	22				
Colored urine	Yes	84	46	38	0.001	10.1	2.74	1.50-5.01
	No	121	93	28				
Hepatitis	Yes	9	7	2	0.72	0.08	0.58	0.119-2.91
	No	196	132	64				
Peripheral Neuropathy	Yes	23	6	17	0	20.57	8.32	3.10-22.30
	No	182	133	49				
Visual problems/headache	Yes	13	9	4	0.9	0.012	0.93	0.27-3.14
	No	192	130	62				
Auditory effects/vertigo	Yes	15	10	5	0.92	0.009	1.05	0.34-3.22
	No	190	129	61				
Skin Problems	Yes	18	8	10	0.03	4.93	2.92	1.09-7.79
	No	187	131	56				

**DISCUSSION**

The present study was conducted in Tiruvallur district TB centre includes 205 patients. As we look into the socio demographic characteristics of this study population

74.1% were males and 25.8% were females. In a similar study done by Mahala, et al. in Uttarakhand, 68% were males and rest were females [5]. We see that there is a predominance of males in both the studies assuming negligible sampling errors. Males seem to be more

commonly affected by TB. This can be due to males facing inherently higher risk of contracting TB by virtue of their occupation, life style habits like smoking, alcoholism etc. In the present study, 87.3% had pulmonary TB and 12.6% had extra pulmonary TB. In a similar study done by Uria, et al. in Andhra Pradesh, 63.9% had Pulmonary TB and 9.1% had Extra Pulmonary TB [6]. In the present study there was significant association between treatment adherence with smoking, alcohol consumption and HIV/AIDS status of the participant. In a similar studies done by Gopi, et al. in Tamil Nadu, where there was significant association between treatment adherence with smoking and alcohol consumption [7]. In the present study there is significant association between treatment adherence with adverse effects GIT disturbance, peripheral neuropathy and skin problems. This finding is similar with those studies done by Kandel, et al. in Kerala [8]. In the present study there is significant association between treatment adherence with diagnostic attributes like type of TB, Place of diagnosis, family history, and place of treatment, patient category and number of months of treatment completed. This finding is similar to study done by jaggarajamma, et al. and Gopi, et al. in Tamil Nadu, Bagchi, et al. in Maharashtra [9]. This clearly shows that Patients diagnosed with Pulmonary TB in a private sector with no family history of Tuberculosis on CAT I has more possibilities of discontinuing their treatment by the end of Intensive phase. We need enhance more public private partnership. Also presence of family history of TB is seen to be associated with better adherence to TB treatment. This can be due to the fact that in the presence of family history of TB, the patients become more aware of the ill effects of the non-adherence to TB treatment.

### CONCLUSION

In this study 67.8% of the study participants were adherent to treatment and 32.1% of the participants were non-adherent to TB treatment. From the results of this study it is concluded that a more extensive approach for simple access to drugs, an assured drug supply to each and every patient, valuable solutions regarding travel related issues, adoption of healthy lifestyle habits and emphasis on patient motivation to hospital visits for a procure therapy are essential for treatment completion among patients with TB in the study area. In order to

raise the awareness to public regarding signs and symptoms, free availability of services and early undiagnosed TB consequences of the TB disease we recommend the strengthening of the educational campaigns conducted in regional TB program.

### REFERENCE

1. Murray CJ, Lopez AD. Mortality by cause for eight regions of the world: Global Burden of Disease Study. *Lancet* 1997; 349:1269-1276.
2. Fund G. HIV/AIDS, Tuberculosis and Malaria, the Status and Impact of the Three Diseases. The Global Fund. 2005.
3. Gupta PK, Nawaz MH, Mishra SS, et al. Value addition on trend of tuberculosis disease in india-The current update. *Inter J Tropical Dis Health* 2020; 41:41-54.
4. Singh V, Jaiswal A, Porter JDH, et al. TB control, poverty, and vulnerability in Delhi, India. *Trop Med Int Health* 2002; 7:693-700.
5. Obwoye RO, Sang RA, Wakube A. Factors associated to non-adherence in tuberculosis treatment, Baringo County, Kenya. *Int J Sci Res Innov Technol* 2016; 3:85.
6. Kulkarni PY, Akarte SV, Mankeshwar RM, et al. Non-adherence of new pulmonary tuberculosis patients to anti-tuberculosis treatment. *Ann Med Health Sci Res* 20 13; 3:67-74.
7. Hoa NP, Thorson AE, Long NH, et al. Knowledge of tuberculosis and associated health-seeking behaviour among rural Vietnamese adults with a cough for at least three weeks. *Scand J Public Health Suppl* 2003; 31:59-65.
8. Fochsen G, Deshpande K, Diwan V, et al. Health care seeking among individuals with cough and tuberculosis: a population-based study from rural India. *Int J Tuberc Lung Dis* 2006; 10:995-1000.
9. Maswangany NV, Lebesse RT, Mashau NS, et al. Patient-perceived factors contributing to low tuberculosis cure rate at Greater Giyani healthcare facilities. *Health SA Gesondheid* 2014; 19:1-8.