

## A Cross Sectional Study to Assess the Non-Adherence to Anti-Tuberculosis Treatment and Determinant Factors among Patients with Pulmonary Tuberculosis

Harshul Gohel\*, Gopika Patel\*, Esha Shah\*, Harvy Shah\*, Harmony Dholakia\*, Harsh Patel\*

### Abstract :

**Aims:** Due to non-adherence of tuberculosis (TB) patients to treatment, complications may arise and if remaining infectious, these patients may infect other people with TB. To obtain information about factors associated with non-adherence, we performed a study comparing adherent and non-adherent TB patients. **Method:** Adherent and non-adherent patients randomly selected from government hospital and private hospital were interviewed using pre structured questionnaires. Key informant interviews were done with patients. **Results:** The most frequently mentioned reason for non-adherence to treatment was taking treatment from government hospital. Although the drugs were given free of charge, many patients were non-adherent because of lack of money, attitude and misbeliefs of patient. Social support was considered very important for adherence. The study indicated that patients who had low level of education, frequently travelling were showing non-adherent to treatment. **Conclusion:** Treatment adherence of TB patients receiving treatment in private hospital might be improved by providing health education about treatment duration and side effects, facilitating procedures for receiving treatment free of charge and reducing costs of transportation and consultation. Qualified friendly health care staff able to motivate patients might further improve adherence in government hospital.

**Key words:** Non-Adherence, Patient Adherence, TB Treatment, Tuberculosis.

### Introduction:

Tuberculosis (TB) is a global health concern.<sup>(1)</sup> Tuberculosis is an infectious disease caused by mycobacterium tuberculosis which is transmitted through the air, by ingesting infected milk or meat and it is both preventable and curable disease. People who have pulmonary tuberculosis can infect other through droplet infection when they cough, sneeze, and talk. However, if TB is detected early and fully treated, people with disease quickly become non-infectious and eventually cured.<sup>(2)</sup> For the same reason, in a country like India, where TB is a major public health problem, the focus of public health machinery is on the pulmonary tuberculosis.

India is the highest TB burden country in the world and accounts for more than 25% of the world's incident cases.<sup>(3)</sup> More than 1000 Indians die of TB every day.<sup>(4)</sup> World Health Organisation (WHO) recommended directly observed treatment short course (DOTS) strategy for global TB control which is accepted

worldwide. Direct observation and regular home visits by treatment providers are mainstay under DOTS. Based on DOTS strategy, India's revised national tuberculosis control program (RNTCP) was launched in 1997. Though treatment completion rate reported by RNTCP have improved over the years, recently there have been rising concerns about appearances of drug resistant TB Cases. Incomplete anti tuberculosis treatment (ATT) has been said to be a major reason for emergence of multi-drug resistant strains of TB bacillus and extensively drug resistant.<sup>(5)</sup> There have been some researches which have demonstrated that DOTS alone cannot ensure 100% adherence from TB patients.<sup>(6)</sup> ATT being a regimen with complex combination and spanning over at least 6 months' duration, patients' adherence may be decreased with time during treatment. Patients on ATT may also have unpleasant side effects of the drugs.<sup>(7)</sup> As a result, the numbers of defaulters are still higher in India.<sup>(8)</sup> Inadequate ATT may result in relapse and contribute to increase in morbidity, mortality, cost, duration of ATT and drug resistance at both individual and community level.<sup>(6,9)</sup>

Current study was conducted with aim to investigate various factors which may affect the level of adherence among patients of TB who are taking treatment.

\* Final MBBS Medical student,  
GCS Medical College, Ahmedabad, Gujarat, India

**Corresponding Author :** Harshul Gohel

**E-mail :** gharshul515@gmail.com

**Methodology:**

Current cross sectional study was conducted at State TB Demonstration and Training Centre (STDC), Civil

Hospital, Ahmedabad (representing government institute) and Sparsh Hospital, Pulmonology Clinic, Navarangpura (representing private institute), from

**Table 1: Association of Socio Demographic Factors with Adherence**

Socio Demographic Factors		Have you ever missed any dose of AKT?		Total	p value
		No (%)	Yes (%)		
<b>Gender</b>	<b>Female</b>	48.8	51.3	80	0.0476
	<b>Male</b>	60.8	39.2	120	
<b>Level of education</b>	<b>College and above</b>	50.0	50.0	20	0.0097
	<b>Higher secondary</b>	41.7	58.3	12	
	<b>Secondary</b>	72.4	27.6	58	
	<b>Primary</b>	41.1	58.9	56	
	<b>Just Literate</b>	43.8	56.3	16	
	<b>Illiterate</b>	65.8	34.2	38	
<b>Marital status</b>	<b>Married</b>	55.4	44.6	177	0.3149
	<b>Unmarried</b>	60.9	39.1	23	
<b>Employment status</b>	<b>Employed</b>	55.4	44.6	101	0.4372
	<b>Unemployed</b>	56.6	43.4	99	
<b>Type of Family</b>	<b>Joint</b>	54.9	45.1	8282	0.5634
	<b>Nuclear</b>	54.9	45.1	102	
	<b>Three generation</b>	68.8	31.3	16	
<b>Family Income (Social Class)*</b>	<b>&gt;=6186 (I)</b>	64.0	36.0	89	0.1014
	<b>3093 - 6185 (II)</b>	38.9	61.1	18	
	<b>1856 - 3092 (III)</b>	42.1	57.9	38	
	<b>928 - 1855 (IV)</b>	59.2	40.8	49	
	<b>&lt;927 (V)</b>	50.0	50.0	6	
<b>Caste</b>	<b>General</b>	49.4	50.6	79	0.0122
	<b>SC</b>	55.2	44.8	29	
	<b>SEBC (OBC)</b>	54.2	45.8	72	
	<b>ST</b>	90.0	10.0	20	
<b>Age Group</b>	<b>0 - 4</b>	0.0	100.0	1	0.3285
	<b>15 - 64</b>	55.4	44.6	186	
	<b>&gt;=65</b>	69.2	30.8	13	

June 13 to July 15, 2016. The study subjects included patients who were on DOTS and registered at STDC. A total of 200 patients (100 each from government and private institute), selected by purposive sampling, were included in the study. The data was collected by face to face interview, using a pre structured questionnaire. The data entry was done using MS Excel, which was analysed using Epi Info v 7.0.

Patients who had missed at least one prescribed dose of TB drug were deemed as non-adherence.<sup>(10)</sup> The other terms used in the present study are as defined under Revised National Tuberculosis Program (RNTCP).<sup>(11)</sup>

The questionnaire included five sections: socio-demographic characteristics (Gender, age, educational level, marital status, and employment status); social support; knowledge and attitude towards anti-TB treatment; travel time from home to the nearest CHC; and adherence to anti-TB treatment.

The study was conducted among patients of Ahmadabad city who were treated for tuberculosis using the standard treatment regimen of DOTS. The age of the patients ranged from 14 to 82 years old, with mean age of 40.715 (standard deviation (SD): 14.129) years. It was found that the level of non adherence is higher at young age. Overall, 44.00% of the patients were considered non-adherent. In the present study, out of the total population treated, 60% are male and 40% are female. Out of various factors, significant associations were found for gender, the level of education and the caste. ( $p < 0.05$ ) (Table 1). Higher non adherence was found among those patients receiving treatment from government set up with statistically significant difference. (Figure 1).

**Figure 1: Health facility and Non-adherence**

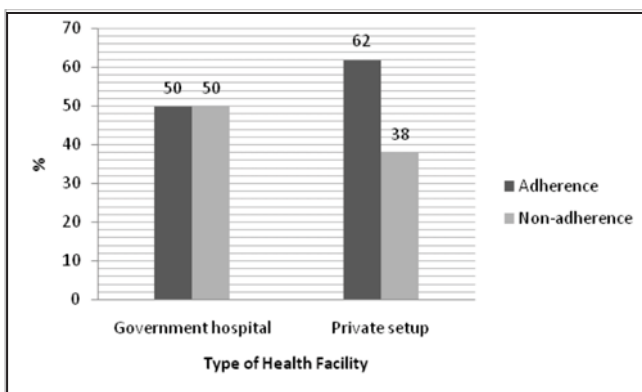


Figure 1 and Table 2 present the various treatment related factors affecting level of adherence. Patients who were taking treatment from government setup, revealed more non adherence (50%) to DOTS compared to those taking from private setup (38%). As expected, patients on category II of DOTS showed lesser adherence (38.1%) then those on Category I (60.4%). It was found that taking the medicine by self was associated with more non adherence (42.2%), for which the significant statistical associated could not be established. It was found that proper explanation by DOTS provider certainly improved the adherence amongst study subjects (56%) ( $p < 0.01$ ). By taking medicines along while travelling, subjects could become more adherent (59.2%). Many patients could find difficulty in swallowing the tablets. The non adherence was seen more amongst such patients ( $p < 0.01$ ). More non adherence was seen amongst those who could not distinguish between tablets. Disappearance of symptom did not have effect on the level of adherence. More non adherence was found amongst those facing adverse effect of DOTS, missing monthly appointments, feeling ashamed of taking pills in front of others and those who lacked family support.

**Discussion:**

Present study showed higher non adherence among females. Different finding was observed by a study conducted by Shahrezaei et al.<sup>(12)</sup> The difference of level of education amongst males and females in India can be responsible for different finding. Current study showed lesser non adherence amongst illiterate subjects. This again was contradictory to the findings by Weiguo et al.<sup>(13)</sup> It the present study, no difference was seen between employed and unemployed groups. Similar results were obtained by study conducted by Gopi et al.<sup>(14)</sup> It was revealed that employment status was not affecting level of adherence to DOTS. Similar result was also obtained by Gopi et al.<sup>(14)</sup> Significant difference was observed between patients attending government and private health facilities. This finding is similar to what was found by Gopi et al.<sup>(14)</sup>. In the present study it was found that, the proper explanation about treatment by a health worker could significantly improve the level of adherence to DOTS. This finding is in accordance to the results revealed by Pandit and Chaudhary.<sup>(15)</sup> Those having difficulty in swallowing were showing higher non

Table 2: Treatment Related Factors

Question		Have you ever missed any dose of AKT?			p value
		No (%)	Yes (%)	Total	
Which type of category of treatment	Category I	91 (61.9%)	56 (38.1%)	147	0.0028
	Category II	21 (39.6%)	32 (60.4%)	53	
Are you able to take medicine on your own?	No	9 (75.0%)	3 (25.0%)	12	0.0931
	Yes	103 (54.8%)	85 (45.2%)	188	
Was proper explanations given by DOT provider?	No	3 (5.0%)	57 (95.0%)	60	0.0000
	Yes	109 (56.0%)	31 (44.0%)	140	
Do you take your medicine with you when you travel?	No	19 (44.2%)	24 (55.8%)	43	0.0416
	Yes	93 (59.2%)	64 (40.8%)	157	
Do you have any problem in swallowing tablets?	No	105 (62.5%)	63 (37.5%)	168	0.00001
	Yes	7 (21.9%)	25 (78.1%)	32	
Are you able to distinguish tablets?	No	54 (62.8%)	32 (37.2%)	86	0.0478
	Yes	58 (50.9%)	56 (49.1%)	114	
Have you experienced any adverse effect of medicines?	No	33 (68.8%)	15 (31.3%)	48	0.0211
	Yes	79 (52.0%)	73 (48.0%)	152	
Do you feel that TB patient need to keep anti-TB treatment up when symptoms disappear?	No	7 (17.9%)	32 (82.1%)	39	0.0000
	Yes	105 (65.2%)	56 (82.1%)	161	
Did you miss your monthly clinic appointment?	No	104 (68.4%)	48 (31.6%)	152	0.0000
	Yes	8 (56.0%)	40 (44.0%)	48	
Did any of your family members get infection?	No	94 (54.0%)	80 (46.0%)	174	0.0756
	Yes	18 (69.2%)	8 (30.8%)	26	
Do you feel ashamed of taking medicines in front of other people?	No	88 (65.7%)	46 (34.3%)	134	0.00005
	Yes	24 (36.4%)	42 (63.6%)	66	
Does your family and society support you?	No	8 (32.0%)	17 (68.0%)	25	0.0057
	Yes	104 (59.4%)	71 (40.6%)	175	
How do you take your medication?	With food	35 (53.8%)	30 (46.2%)	65	0.000582
	With food, Without food	7 (25.0%)	21 (75.0%)	28	
	Without food	70 (65.4%)	37 (34.6%)	107	
Are you comfortable with current medication?	Not at all	0 (0.0%)	2 (100.0%)	2	0.070467
	Not really	0 (0.0%)	2 (100.0%)	2	
	Some what	81 (61.4%)	51 (38.6%)	132	
	Undecided	16 (44.4%)	20 (55.6%)	36	
	Very much	15 (53.6%)	13 (46.4%)	28	

adherence to DOTS in the current study. However, this finding differs from the results obtained by Gopi et al.<sup>(14)</sup> Those having adverse effect of DOTS were less adherent than those without adverse effect. Similar findings were observed by Burman et al<sup>(16)</sup>. It was found that those who tend to miss their regular monthly meeting were having more non adherence compared to others. Similar findings were seen by Weiguao et al.<sup>(13)</sup>

### Conclusion & Recommendation:

This study shows that adherence of patients to their medication is not only affected by patient taking medication as prescribed but also parents' knowledge of TB, presence or absence of other reasons like feeling better, forgetfulness and residence area. Our study indicates that non-adherence among female pulmonary TB patients and who is taking treatment from government setup are common and patients' knowledge about anti-TB treatment is crucial to improve pulmonary TB patients' treatment adherence. In the DOTS, health care providers should assure that all patients understand the core knowledge of anti-TB treatment regimen and the importance of adherence. Side effect and other reasons which account for missing the dose should be monitored early so that patients will adhere more to their medication. In addition, efforts in improving those TB patients' general access to care may also help them to complete TB treatment.

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