

## Challenges Linked With Adherence to Treatment by Adult TB Patients in Pakistan

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**Abstract:** To be aware of non compliant TB patients for drug loyalty and also investigating the dread for drugs in them. For public health community, tuberculosis (TB) has accessible confront in the developing countries although curative drugs exist, yet TB has remained the foremost killers among infectious diseases. The TB treatment regimen is long, intensive and fraught with potential side effects. For these reasons, only about 20% of people with TB successfully complete treatment. Cross sectional survey was conducted on a non-probability purposive sample of 349 TB patients attending JPMC Chest OPD, Malir Chest Clinic and Ojha Institute of Chest Diseases, Karachi in the month of June and July, 2007. All the patients who were administered Anti-tuberculous drugs (ATT) under Direct Observed Treatment Strategy (DOTS) in the above mentioned period were included in the study. The total response rate was 93%. Out of 349 TB patients observed, 43% [150] were males and 57% [199] were females. 94% of the patients were following DOTS i.e. they regularly came to the clinics, but 5% were those who did not follow it regularly and skipped the daily medicine. Only 13% have quit taking medication themselves. 60% of the patients experienced side effects of the anti-TB drugs whereas 40% didn't experience any side effects. Proper counseling regarding the treatment options and side effects of the treatment can help reduce the challenges associated with adherence to the TB treatment.

**Keywords:** DOTS therapy, Pakistan, Tuberculosis.

### I. Introduction:

Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis, and spreads by inhalation of infective droplets. Disease primarily affects lungs and impairs pulmonary functions but it can spread to almost any organ of the body. <sup>[1]</sup> TB is one of the 3 infectious diseases along with malaria and HIV that contributes to the major burden of communicable diseases. <sup>[2]</sup> Each year nearly 9 million people emerge as new cases of TB of which about 2 million die predominantly in developing countries. <sup>[3]</sup> Although TB is an ancient disease, it still contributes significantly to global human mortality and mortality. <sup>[4]</sup>

Despite the fact that the disease is preventable and curable; the development of effective treatment for TB continues to be a challenge all over the world. <sup>[5]</sup> Following the same treatment strategy that was developed 50 years ago; TB patients have to take medication on daily basis for 6 to 8 months or more depending on the severity of disease. <sup>[6]</sup> The primary symptoms of the disease disappear in approximately 2-3 months which leads many patients to stop the treatment and non-compliance as interruption in taking the drugs prevents the complete cure and increases the risk of relapse and development of drug resistance. <sup>[7]</sup> Thus poor adherence to the medication remains the major contributor that leads to the deterioration of the disease.

DOT is the strategy recommended by World Health Organization (WHO) to avoid such interruption of treatment. It has not only contributed in improving the TB control but has also helped in better understanding of factors that prevent patients from completing the course of medication which is required in order to improve the outcome of treatment. <sup>[3]</sup> Following are some of the factors identified:

1. Financial burdens of treatment [distance and fares of transportation]<sup>[4,7-11]</sup>
2. Side effects of drugs<sup>[6, 12, 13]</sup>
3. Family, community and household influences
  - a. Isolation of patient by family<sup>[7]</sup>
  - b. Loss of job<sup>[8, 14-16]</sup>
  - c. Difficulty in marriage<sup>[17]</sup>
4. Personal behavior
  - a. High dose of drugs

- b. Long duration of therapy <sup>[18,19]</sup>
- c. Dosage before breakfast <sup>[20]</sup>
- 5. Believes and knowledge about treatment
  - a. Effectiveness of treatment
  - b. Others sources of treatment <sup>[21]</sup>
  - c. Drugs use during pregnancy and lactation by women.

## II. Methods And Material:

### Field work strategy:

A cross sectional study with a purposive non-probability sampling was conducted from June to July 2007 at Jinnah Postgraduate Medical Center (JPMC) Chest OPD, Malir Chest Clinic and Ojha Institute of Chest Diseases (OICD). All the patients who were administered Anti-tuberculous drugs (ATT) under Direct Observed Treatment Strategy (DOTS) in the above mentioned period at these clinics were included in the study. Non-affordability of the treatment was one of the major reasons why these patients were coming to government hospitals as most of them belonged to lower and middle socio-economic class. The number of questionnaires administered were 375. Response rate was 93%.

### Inclusion criteria:

(i) The patients that have been on anti-TB drugs for at least one month, (ii) The patients showing cardinal clinical features of pulmonary TB, such as chronic cough, haemoptysis, weight loss and night sweats and (iii) Patients with age ranging between 12 and 55 years.

### Exclusion criteria:

(i) Children below the age of 12 years, (ii) Newly diagnosed patients.

### Research design:

Structured questionnaire and individual interviews were used to obtain information from TB patients. The structured questionnaire and interview questions were developed by consulting pharmacology textbooks and research journals under supervision of GA. The questionnaires were administered to patients with the following sections; (a) Demographic and socio-economic characteristics such as age, occupation and education, approximate income of the house. (b) Drug information; such as anti-TB drugs counseling, side effects of anti-TB drugs and the reasons why patients stopped taking anti-TB drugs.

### Ethics approval:

Ethical approval and written permission was obtained from Director OICD; in charge OPD, JPMC and owner, Malir Chest Clinic to conduct the research before administering the questionnaires to the patients. The informed consent was obtained from each and every patient and confidentiality of the data was assured.

### Data Collection and Analysis:

Individuals' interviews were conducted by the trained students under the supervision of FK and AM to record the perspective of patients. Analysis of the completed questionnaires was carried out using Statistical Package for the Social Sciences (SPSS 16.0). The data were analyzed using descriptive statistics which involved the use of frequency distribution and percentages.

## III. Results:

**Table 1: Demographic and socio economic characteristics of TB patients**

Parameters Studied	Classification	Males		Females		Total		p value $\chi^2$
		(n) <sup>*</sup>	(%) <sup>□</sup>	(n)	(%)	(n)	(%)	
Age in years	12 – 17	8	5.3	36	18.1	44	12.6	<0.001
	18 – 30	45	30.0	79	39.7	124	35.5	
	31 – 45	47	31.3	63	31.6	110	31.5	
	46 and above	50	33.3	21	10.5	71	20.3	
Marital Status	Single	25	16.7	13	6.5	38	10.9	<0.001
	Married	111	74.0	151	75.9	262	75.1	
	Widowed	6	4.0	18	9.0	24	6.9	
	Divorced	8	5.3	17	8.5	25	7.1	
Occupation	Students/No employment	24	16.0	71	35.7	95	27.2	<0.001
	Professionals	21	14.0	9	4.5	30	8.6	
	Government Employees	41	27.3	34	17.1	75	21.5	
	Businessmen	31	20.6	13	6.5	44	12.6	

	Self employed	33	22.0	72	36.2	105	30.1	
Education	No formal education	26	17.3	89	44.7	115	33.0	<0.001
	Primary school	67	44.7	77	38.7	144	41.3	
	Secondary school	46	30.7	29	14.6	75	21.5	
	Graduate or higher	11	7.3	4	2.0	15	4.2	
Income of the household p.m.	<5000	42	28.0	99	49.7	141	40.4	<0.001
	5000-10000	78	52.0	49	24.6	127	36.4	
	10001-15000	19	12.7	9	4.5	28	8.0	
	>15000	6	4.0	5	2.5	11	3.1	
Number of dependants	Not sure	5	3.3	37	18.6	42	12.0	0.062
	None	6	4.0	4	2.0	10	2.9	
	1-5	57	38.0	72	36.2	129	36.9	
	6-10	68	45.4	111	55.8	179	51.3	
	>10	19	12.6	12	6.0	31	8.9	

\* n = Frequency, □ %= Percentage, †p value <0.05= significant, <0.01=very significant, <0.001= highly significant

Out of total 349 TB patients observed, 43% (150) are males and 57% (199) are females. Approximately half of the patients (48.1%, n=168) were less than 30 years of age. Majority of the patients included in the study were married (75.1%, n=262). Approximately 7% (24) patients were widowed out of these spouse of 58.4% (n=14) had diagnosed TB before death. Majority of the females (35.7%, n=71) were either students or not employed whereas 27.3% (n=41) of the males were government employees with jobs ranging from peon to clerks or office assistants.

Approximately 30.1% (n=105) patients were self employed and were either working as laborers on daily wages or were house servants. Most of the patients (74.3%, n=159) either did not had any formal education or had formal education up to primary only. Majority of the patients (76.8%, n= 168) attending these government hospitals belong to the class where the average income was up to Rs. 10000 per month only. The approximate income of a household was calculated to be Rs. 6874 only. According to data, the income of 28% males (n=42) and astonishing 49.7% (n=99) females was less than 5000 rupees per month, income of 52% males (n=78) and 24.6% females (49) was between 5000-10000 rupees per month and income of only 4% (n=6) males and 2.5% (n=5) females was above 15000 per month. The average dependent members in the house were 7 in number. Approximately 60.2% (n=210) patients had greater than 5 dependants. (Table 1)

**Table 2: Gender based differences among some common observations related to DOTS**

Variables	Classification	Males		Females		Total		p value □
		(n)*	(%) □	(n)	(%)	(n)	(%)	
Are you following DOTS	Yes	142	94.7	187	93.9	329	94.3	0.02
	No	6	4.0	11	5.5	17	4.9	
	Don't know	2	1.3	1	0.5	3	0.8	
DOTS is effective against TB	Yes	138	92.0	177	88.9	315	90.2	0.03
	No	4	2.7	7	3.5	11	3.1	
	Don't know	8	5.3	15	7.5	23	6.6	
When to stop ATT	When symptoms end	19	12.7	28	14.1	47	13.5	<0.01
	When doctor advices	131	87.3	171	85.9	302	86.5	

\* n = Frequency, □ %= Percentage, †p value <0.05= significant, <0.01=very significant, <0.001= highly significant

The analysis shows that 94% (n=329) of the patients are following the DOT therapy strictly and regularly whereas 5% are those who do not take medicine regularly and skip their medicines. Majority (90.2%, n=315) believed that DOTS was an effective treatment against TB while 7% were not sure of its effectiveness. Most of the patients (86.5%, n=302) knew that the treatment should only be stopped on the doctor's advice only where as 13.5% (n=47) believed that there is no need to continue the treatment as soon as the symptoms end. (Table 2)

**Table 3: Reasons for discontinuing ATT**

Parameters Studied	Classification	Males		Females		Total		p value □
		(n)*	(%) □	(n)	(%)	(n)	(%)	
Multiple drugs before breakfast	Yes	129	86.0	190	95.5	319	91.4	<0.01
	No	21	14.0	9	4.5	30	8.6	

Long duration of the therapy	Yes	139	92.7	189	94.9	328	93.9	<0.01
	No	11	7.3	10	5.0	21	6.0	
Large doses to be taken orally	Yes	119	79.3	147	73.8	266	76.2	0.03
	No	31	20.7	52	26.1	83	23.8	
Side effects of the drugs	Yes	97	64.7	114	57.3	211	60.4	0.064
	No	53	35.3	85	42.7	138	39.5	
Use of drug during pregnancy and lactation	Yes	103	68.7	128	64.3	231	66.2	0.07
	No	47	31.3	71	35.7	118	33.8	
Financial Burdens of treatment (including distance and fares of transportation)	Yes	121	80.7	176	88.4	297	85.1	<0.01
	No	29	19.3	23	11.5	52	14.9	
Family, community and household influences	Yes	117	78.0	161	80.9	278	79.6	0.02
	No	33	22.0	38	19.1	71	20.3	

\* n = Frequency, <sup>□</sup> %= Percentage, †p value <0.05= significant, <0.01=very significant, <0.001= highly significant

The patients were also asked about the reasons they considered for leaving the treatment for TB based on their experiences and believe. Approximately 91% (n=319) patients regarded the number of tablets taken per dose as the reason for leaving the treatment. Majority of the patients agreed that long duration of the therapy (93.9%, n=328) and large doses taken orally (76.2%, n=266) are important reason for the non-compliance of patients with the anti-tuberculosis treatment. Side effects of the anti-TB drugs were experienced by 60.4% (n=211) of the patients. Among these patients, 58.3% (n=123) developed orange colored body secretions, 6.2% (n=13) developed joint pain especially in limbs, 4.2% (n=9) developed red green color blindness, 5.2% (n=11) have complained of hair fall and 10% (n=21) developed jaundice. A considerable number of the patients (33.8%, n=118) believed that taking ATT during pregnancy will harm their child. They also feared that during lactation, the drugs can be secreted in breast milk that can have toxic effects on their child's health. Although, the drugs in DOTS are supplied free of cost to the patients but several other financial burdens prevent the patients from continuing the treatment which is reflected from the data as well as 85.1%, n=297 patients had financial problems including fares of the transport. Patients working on daily wages were affected most as they had to visit hospital daily to take medicines instead of going to work. A very important factor in non-compliance of ATT was social influence. Majority of the patients (79.6%, n=278) believed that family, community and household influences have a major role in their decision to discontinue the medication for TB. They were afraid that they will be isolated and abandoned by their family members and other community members so they discontinue the medicine on their own as soon as the symptoms are reduced. (Table 3)

**Table 4: Knowledge and Myths related to ATT**

Parameters Studied	Classification	Males		Females		Total		p value <sup>□</sup>
		(n) <sup>*</sup>	(%) <sup>□</sup>	(n)	(%)	(n)	(%)	
Is TB curable?	Yes	132	88.0	180	90.4	312	89.4	<b>0.01</b>
	No	3	2.0	3	1.5	6	1.7	
	Don't know	15	10.0	16	8.0	31	8.9	
Possible recurrence of the disease despite treatment	Yes	27	18.0	37	18.6	64	18.4	0.02
	No	116	77.3	158	79.4	274	78.5	
	Don't know	7	4.7	4	2.0	11	3.1	
Cure of TB in other institutions	Homeopathic	34	22.7	56	28.1	90	25.8	0.36
	Eastern Medicine	83	55.4	73	36.7	156	44.7	
	Spiritual Modalities	33	22.0	70	35.1	103	29.5	
ATT causes infertility	Yes	29	19.3	52	26.1	81	23.2	0.12
	No	88	58.7	99	49.7	187	53.6	
	Don't know	33	22.0	48	24.1	81	23.2	

\* n = Frequency, <sup>□</sup> %= Percentage, †p value <0.05= significant, <0.01=very significant, <0.001= highly significant

Patients were evaluated about the myths related to TB and on being asked whether TB is curable or not, 89.4% (n=312) patients believed that TB is a curable disease. Most of the patients (78.5%, n=274) believed that there is a possibility of recurrence of the disease despite treatment. The patients also believed that the cure of TB

is present in other institutions. Approximately 45% (n=156) patients had belief that eastern medicine can cure TB while 25.8% (n=90) and 29.5% (n=103) patients thought that homeopathic and spiritual modalities respectively were favorable as far as the treatment of TB is concerned. On enquiring whether infertility is a complication of ATT, 23.2% (n=81) patients agreed while similar number of patients were not sure if ATT causes infertility or not. (Table 4)

#### **IV. Discussion:**

TB is a major contributor of the burden of disease in developing countries. It has received considerable attention in recent years but poor adherence to the treatment and phobia for the ATT drugs is still a common problem. Although analysis reveals that in patient's view DOT is effective against TB and patient follow it regularly but the chain of factors and phobias identified in this research are intricately linked and likely to have a combined effect on patient's adherence to treatment. There is a need for a shift in perspective to give great attention to these factors and phobias in relation to TB infection.

Another important issue explored in this research includes how gender determines response to treatment. Females in Pakistan, rely on their husbands and other males in the family for social and financial support, they have limited freedom to travel. This can be the main reason in non-adherence to medication in females. Phobia in female patients regarding ATT in pregnancy and lactation is also an important factor which was not studied in this study.

Community, family members, colleagues indirectly influence medication. Patient under strong influence of stigma among family member and phobia of isolation from community hide their disease. Employees hide their disease state because of the fear of unemployment. Patients' perception of marriage prospects greatly influences the treatment as well.

There are certain side effects of drugs used in the treatment of TB and they are mentioned in a number of studies. Orange-yellow coloration of urine, tear and other body fluids, neuropathy, jaundice, red-green color blindness, all these can influence the decision of the patients to abandon treatment. Complete information of drug side effects should be provided to patients before they experience it.

New drug regimen should be introduced to decrease the long duration of treatment. <sup>[18, 19]</sup> Phobia for the drug therapy can be reduced if the patients understand the importance of completing treatment and consequences of defaulting. Race and gender are important social factors that play a very important role in the continuation or completion of the therapy. Cultural beliefs and use of traditional medicines can also cause hindrance in patients' compliance. Use of other means of treatment e.g. Hakim and homeopathic medicine should be discouraged.

#### **V. Conclusion:**

This research indicates that patients during TB medication experience significant challenges. The fact that these patients are not counseled adequately regarding the treatment options and side effects of the drugs makes it difficult for the patient to adhere to the treatment. Poverty is another challenge that compromises the adherence to treatment. There is a stigma associated with the disease which makes life further difficult for the patient. All of these issues need to be addressed in order to achieve the success in treating the TB patients. New interventions to promote treatment adherence and eliminate phobia could be designed while keeping these factors in mind. Further research is needed both to understand people's experience of TB and its treatment and to develop approaches to improve them.

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