

## **The role of socio-economic factors responsible for non-compliance of directly observed treatment short-course among tuberculosis patients**

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### **Abstract**

**Introduction:** Tuberculosis has gone out of control in many parts of world. The therapeutic regimens given under direct observation as recommended by world Health Organization have been shown to be highly effective for both preventing and treating tuberculosis but poor compliance to anti-tuberculosis medication (ATT) is a major barrier to its global controls.

**Objectives:** The role of socio-economic factors responsible for non-compliance of directly observed treatment short-course (DOTS) among Tuberculosis Patients.

**Materials and Methods:** Cross sectional study, interviewed using a set of questionnaire. Participants were enrolled at DOTS centre of Lala Ram Sarup Institute of tuberculosis and Respiratory disease New Delhi, India. Patients who interrupted treatment for more than 2 months consecutively were classified as non-compliance cases. T-test was used for comparing the means of the control and case groups.

**Results:** Majority of study population (45%) was in age group of 31-45 years, which is the productive age. 85 % noncompliant patients believed anti TB drugs to be bad and 15 % accepted as good for them. Similarly 87 % believed to stop ATT very prematurely as soon as symptoms disappear while 13 % believed to continue as per DOTS volunteer advice. The study revealed that the non-compliance of DOTS was significantly high among those who were less educated, unskilled worker, low family income and upper lower class family.

**Conclusion:** In Delhi region, the treatment of Tuberculosis was good and did not have much involvement of socio-economical role in the non-compliance of treatment. But still major hurdle is the inadequate education, occupation, and income.

**Keywords:** Tuberculosis, non-Compliance, adherence, DOTS, treatment outcome.

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## Introduction

Tuberculosis (TB) is one of the major health problems and has gone out of control in many parts of world. In 1993 the World Health Organization (WHO) declared TB a global emergency<sup>1, 2</sup>. TB is an ancient disease which continues to effect major health challenge to developing countries. Every year almost nine million people develop TB and almost two million die; 35% of cases are from South East Asia region<sup>3, 4</sup>.

The therapeutic regimens given under direct observation as recommended by WHO have been shown to be highly effective for both preventing and treating TB but poor adherence to anti-tuberculosis medication (ATT) is a major barrier to its global controls<sup>5</sup>. The factors such as self belief after feeling cured, jobs constrains, prolonged period of therapy, socio-economic factors, literacy and social behavior, waiting time with no health education, as well as the adverse drug reaction of anti tubercular drug are the responsible in non-compliance of TB treatment<sup>6,7</sup>. In treatment of TB, non-adherence to prescribed treatment could lead to treatment failure and development of drug resistance while the patient continues to transmit infection. Non-adherence to treatment poses many additional problems for the tuberculosis control such as, defaulter actions, retrieval efforts and change of

chemotherapeutic schedules, etc., which have an adverse economic impact due to increase in operational costs<sup>8-10</sup>.

Inability to complete the prescribed regimen which is quite common in self-administered treatment is an important cause for treatment failure, relapses, acquired drug resistance and on-going transmission of infection. The consequences of default could be disastrous particularly in the context of intermittent Short Course Chemotherapy (SCC) regimens. Over the years there has been increasing emphasis on Directly Observed Treatment short course (DOTS) to ensure treatment adherence, where in each dose of treatment is given under the observation of a health worker. The adoption of DOTS has given impressive results with higher treatment success being reported from developing countries. The Revised National Tuberculosis Control (RNTCP) based on DOTS strategy was implemented in the India in 1993 and is under rapid expansion since 1998<sup>11-13</sup>. the major thrust of RNTCP is achieving a cure rate of more than 85%. Strict adherence to DOTS is likely to minimize defaults and is therefore essential for the desired treatment success<sup>14, 15</sup>.

Poverty and tuberculosis are intimately connected. The poorer have higher contact rates due to crowded homes, more active infection due to sub-optimal nutrition and working

conditions, and they frequently have less access to diagnostic and treatment facilities<sup>16</sup>. They may have less flexibility regarding work and clinic attendance and less ability to pay for medications and transport. A study conducted in an urban area of India in 2000-01 found one quarter of their non-compliant patients were the only economically active person in the family and had no spare time to visit DOTS centers<sup>17</sup>. The political commitment of local administrators to control TB in conjunction with policy benefits and incentives to intensify motivation and counseling is essential for sustainability of the DOTS strategy to improve patient's compliance and reduce default<sup>18, 19</sup>.

This paper reports reasons for non-compliance to treatment among TB patients, elicited during home visits. In the present analysis, patient characteristics related to treatment compliance behavior such as time of default, its frequency, duration were correlated with treatment completion and find out the role of socio-economic status with a view to identifying possible 'risk groups' for focusing preventive actions<sup>7</sup>.

### **Materials and methods**

The cross sectional descriptive study was conducted at various Directly Observed Treatment Short Course centres of Lala Ram Sarup Revised National Tuberculosis Control

Program (LRS-RNTCP) defined area of Lala Ram Sarup Institute of Tuberculosis and Respiratory Disease, Sri Aurobindo Marg, South Delhi, India from 11<sup>th</sup> February 2009 to 20<sup>th</sup> July 2009. Total patients enrolled in LRS-RNTCP defined area for treatment were 566 out of which 80 were selected in this study. Forty patients served as control (i.e. group I) & 40 patients as cases (i.e. group II). The group I received short course chemotherapy as per RNTCP guidelines and was categorized as compliance under DOTS. The group II received short course chemotherapy as per RNTCP guidelines but due to some reason/factors interrupt the short course chemotherapy and patients fall under non-compliance. Following were the selection criteria for non-compliance cases:

- (1)  $\geq 2$  consecutive weeks of therapy were missed
- (2) Treatment was prolonged >30 days longer than planned owing to missed doses or
- (3) Incarceration by the tuberculosis control program for presenting an immediate threat to public health. Patients who missed more than 2 consecutive months of DOT were defined as having defaulted from therapy.

Ten variables were selected for study; the patient's personal factors including age, sex, marital status, socioeconomic class, education levels were studied. Income and occupation

were also observed. The t-test was used for comparing the means of cases and controls. The numbers of proportions were compared with chi-square. The p-value 0.05 was considered as statistically significant. Statistical analysis was performed with SPSS and graphical analysis was performed with Microsoft Excel.

### Results

Five hundred and sixty six tuberculosis patients were enrolled for the treatment during period of 11<sup>th</sup> February 2009 to 20<sup>th</sup> July 2009 in different DOTS centre of LRS-RNTCP defined area. The study revealed that 69 % were male and 31 % female among them. There were 70 % married and 30 % unmarried among them. The distribution of non-compliance according to age group were found in this manner the highest case of non-compliance were observed in patients aged 31-45 year-old (45%) and the lowest was found in patients aged below 14 year-old (2.5%). Prevalence of non-compliance in patients aged 15-30 years, 46-59 years and over 59 years were 35%, 12.5% and 5%, respectively.

The belief regarding anti tuberculosis therapy was noted and found that 85 % of noncompliant patients believed anti TB drugs to be bad and 15 % accepted as good for them. Similarly 87 % believed to stop ATT very prematurely as soon as symptoms disappear

while 13 % believed to continue as per DOTS volunteer advice.

Their behavior for reducing number of tablets per dose daily was noted and found that 95 % of non-complaint patient agree to do so and only 5 % have taken full dose for whole period. The attitude for 6-8 months long term treatment was noted and observed that 90 % of non-compliant patients self terminated ATT many times to take pause but 10 % believed to continue without discontinuation.

According to education level, 50 %, 37.5%, 5% and 2.5% of non-complaint had finished primary school, high school, intermediate/post high school, and graduated the higher levels. Five percents were illiterate (Figure 1).

The distributions of non-compliant patients according to occupation were noted and it was observed that 42.5 % were unskilled worker; 32.5 % were semiskilled worker; 20 % were skilled worker; 2.5 % were clerk shop owners and farm holders. Moreover, 2.5 % were unemployed TB patients as shown in Figure 2.

The status family incomes of noncompliant TB patients were noted. It was found that 45 % had family income between 2,041 and 6,100; 6 % had family income between < 2,040; 35 % had family income between 6,101 and 10,160; 2 % had family income between 10,161 and 15,280.

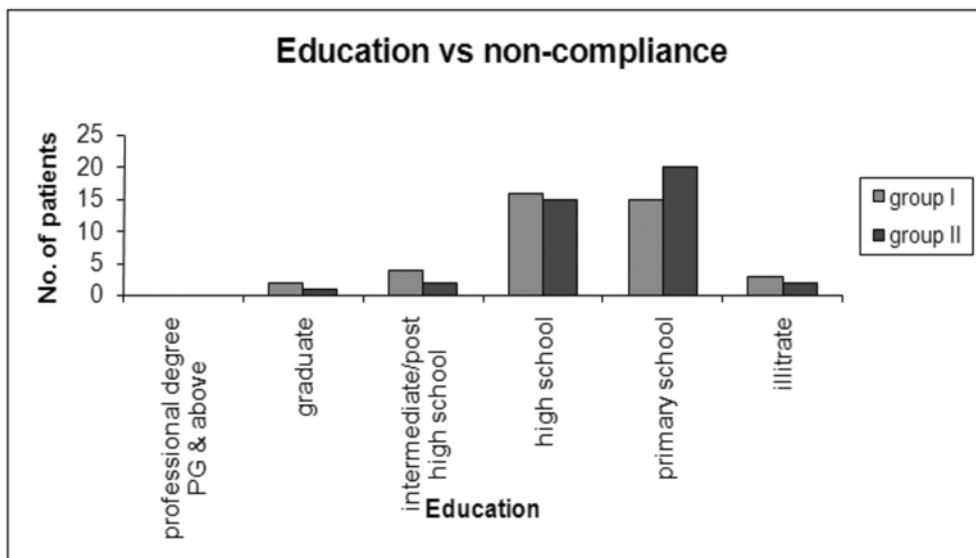


Fig.1 Bar graph Education vs. non-compliance

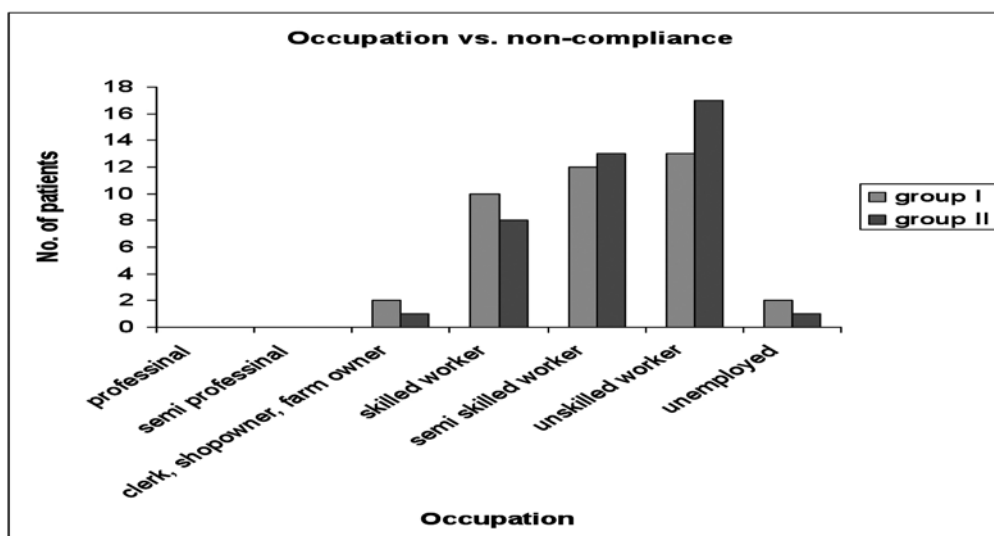


Fig.2 Bar graph Occupation vs. non-compliance

No any patient had family income more than 15,280 (Figure 3).

The socio-economic classes were studied. It was noted that 72.5 %, 22.5%, and 10% of non-compliances were classified as the upper lower class, the lower middle class, and

the lower class, respectively. No any patient was in the upper middle or the upper class of family as shown in Figure 4.

**Discussion**

The present study revealed that the socio-demographic factors (age, sex, education,

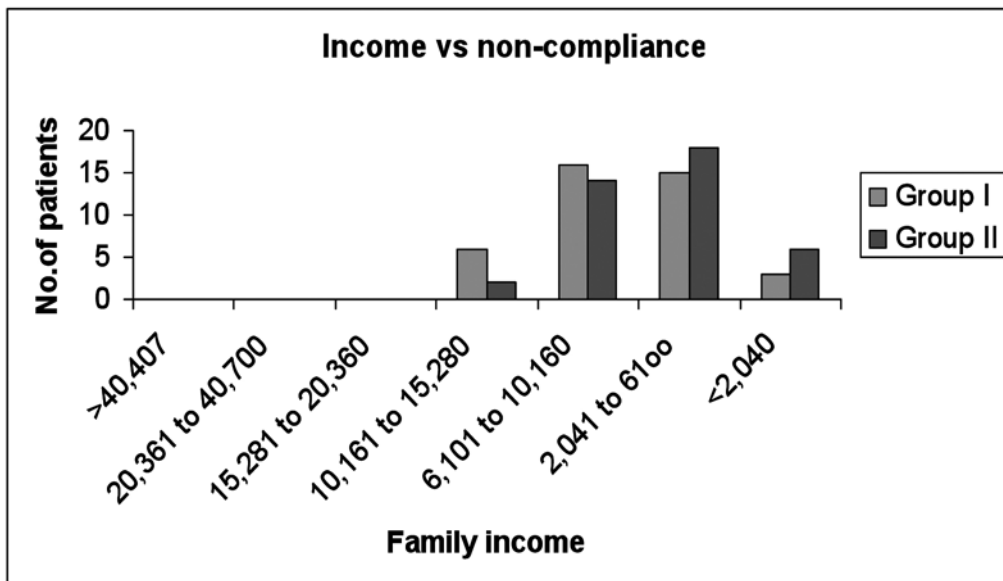


Fig.3 Bar graph Family income vs. non-compliance

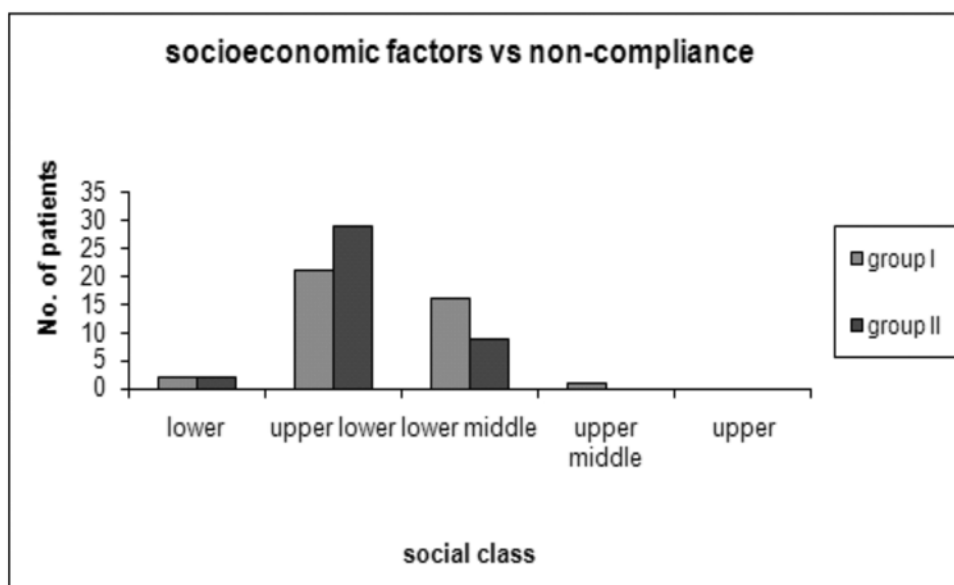


Fig.4 Bar graph Socio-economic class vs. non-compliance

occupation and socio-economic status) were had association with adherence of treatment. It was found that male gender have more noncompliance tendency as compared to female as found by Janani P and Wijitha S also<sup>20</sup>.

The age of noncompliant patients was studied and found that majority of treatment defaulter were from 31-45 years which is also described by Tissera W<sup>5</sup>. The education and literacy plays vital role for default behaviors of

patients. It was noted that non-compliance in treatment of TB patients of south Delhi among primary pass patients are maximum as reported by Pandit N and Choudhary S also<sup>21</sup>.

The noncompliant patients were using government health centre. It was noted that these patients believed in medicine to be bad for health which is the same described by Malik AS and Ahmad G<sup>7</sup> that report the behavioral factor in compliance of TB treatment. The study shows that the majority of patients stop their treatment in intensive phase as the symptoms disappear and feel good the same thing was also reported by Vijay S and Balasangameswara VH<sup>14</sup>.

We have found that the economic condition have great impact on treatment compliance of TB patients which has been pointed out by Fatiregun AA and Ojo AS<sup>22</sup> as factor for nonadherence. The majority of the noncompliant patients answered that long term treatment was difficult to maintain to go the DOTS centre for eating medicine and as well as to maintenance of jobs which was also described by Driver CR and Matus SP<sup>23</sup> also that dropout is due to prolonged treatment.

The occupation of TB patients have direct impact to the compliance of treatment and it was found that the unskilled TB patients were more prone to nonadherence as similarly

also found by Joanna BR and Causland MR<sup>24</sup> The socioeconomic status was the one of the major contributing factors for noncompliance of TB treatment which was also pointed out by Dodor EA and Afenyadu GY<sup>25</sup>.

### **Conclusion**

In Capital of India, especially in south Delhi region the treatment of tuberculosis under DOTS-RNTCP program was good and did not have much involvement of socio-economical role in the non-compliance of treatment. However, inadequate education, occupation, and income were a major hurdle to achieve. The slum and rural area, where Information Education and Communication (IEC) activity was less, contributed for non-compliance of treatment of DOTS as compared to urban area.

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