CHAPTER V

RESULTS OF THE STUDY

The results obtained after data collection are presented under different headings

dealing with the main aspects of the study.

Table 5.1 Background Characteristics of the Tuberculosis Patients

Background characteristics	No	%
Demographic factors		
Age distribution of the patients		
15 – 29 years	56	29.4
30 – 44 years	59	31.1
45 – 59 years	40	21.1
60 – 70 years	35	18.4
Total	190	100.0
Sex distribution of the patients		
Male	130	68.4
Female	60	31.6
Total	190	100.0
Marital status of the patients		
Unmarried	34	17.9
Married	156	82.1
Total	190	100.0
Socioeconomic factors		
Educational status of the patients		
Literate		
Illiterate	118	62.1
	72	37.9
Total	190	100.0

Table 5.1 Background Characteristics of the Tuberculosis Patients (Continued)

Background characteristics	No	%
Occupational status of the patients		
Self business	49	25.8
Farmer / agriculture	63	33.2
House wife	38	20.0
Day labor	40	21.0
Total	190	100.0
Religion of the patients		
Muslim	154	81.1
Hindu	36	19.9
Total	190	100.0
Monthly family income of the patients		
6001 – 9000 Takas	45	23.7
3000 – 6000 Takas	145	76.3
Total	190	100.0

Table 5.1 shows the background characteristics of the TB patients. It was found that TB was more among the age groups of 30 – 44 years (31.1%) and 15 – 29 years (29.4%) than the age groups of 45 – 59 years (21.1%) and 60 – 70 years (18.4%). This might be due to younger age group of people had to go outside every day for their earnings than the older age group of people who used to stay at their homes. This is a common picture in rural Bangladesh. Due to more outside involvement the exposures of tuberculosis contagion are more in the younger age group of people than the older one. The mean age of the patients was 38.97 years with a standard deviation of 1.08. The minimum and maximum age of them was 15 years and 70 years with a range of 55 years.

The study revealed that TB was more in the male population (68.4%) than the females (31.6%). The overall ratio of males to females among the patients was 2.20:1.

The over presentation of male patients over the females might be due to the male population used to deal with the outside world and public. They left their houses for daily jobs and earnings, traveled more than females, did the shopping and mostly exposed to over crowded places. On the other hand the females usually stayed at home in a conservative family in rural Bangladesh. As tubercle bacilli are rapidly killed by sunlight the odds of catching a tuberculosis contagion were supposed to lower for females than males.

The proportion of married patients who were infected with TB was 82.1% while only 17.9% single/ unmarried patients were found to be suffered from tuberculosis. The married people usually lived and sleep together with different family members in a overcrowded room than the single/ unmarried who used to stay alone in a separate room. So overcrowding situation with cross mixing among the married people may be the cause of more TB patients among the married. Moreover another point is to be noted that the number of married people are more in the rural community of Bangladesh. So the incidence of TB should be automatically higher among the married people.

Tuberculosis among the literate people was found to be 62.1%, which was 37.9% in illiterate group.

Proportion of TB patients was found to be 33.2% among the farmer / agriculture group of people. Otherwise it was evenly distributed among different occupational groups.

81.1% of the muslims and 19.9% of hindus were found to be infected with tuberculosis. This might be due to the majority population of Bangladesh are muslims (95%). So the attack rate from tuberculosis was high among them.

Patients whose families monthly income were lower (3000 – 6000 Takas) were found to be suffered more from TB (76.3%) than those whose families monthly income were higher (6001 – 9000 Takas). This might be due to poor hygienic conditions prevailing in the poor class of people. Their diet was not adequate. So they were more susceptible to TB due to poor nutritional status and hygienic condition. The Median monthly family income of the patients was 6000 Takas.

Table 5.2 Proportion of Patients Complied and Failed to Comply TB Treatment

Patients attended for treatment		Total	
		No	%
1.Patients complied treatment		134	70.5
2.Patients failed to comply treatment			
2.1. Patients missed drugs for ≥ 2 weeks	20 (35.7%)		
2.2 Patients missed doses sporadically	28 (50.0%)	56	29.5
2.3 Patients missed an appointment and never returned again	8(14.3%)		
Total		190	100.0

As shown in Table 5.2, 134 patients (70.5%) out of 190 sputum smear positive TB patients complied treatment and 56 (29.5%) patients failed to comply treatment.

Among the patients who failed to comply treatment, 35.7% patients missed drugs for 2 weeks or more than 2 weeks (category 1), 50.0% patients missed doses of drugs sporadically and the anti-tubercular treatment was extended for them for another 1 month (category 2) and 14.3% patients missed an appointment during their period of treatment and never returned again (category 3).

5.3 Effects of Demographic and Socioeconomic factors on Treatment Outcome

Table 5.3.1 Effects of Age on Treatment Outcome among TB Patients

Age group (In years)	Total		Outcome				Odds ratio	95% CI
	No	%	Non-compliant		Compliant			
			No	%	No	%		
15- 29	56	29.4	13	23.2	43	76.8	1	---
30-44	59	31.1	18	30.5	41	69.5	1.45	0.59 – 3.62
45-59	40	21.1	11	27.5	29	72.5	1.25	0.45 – 3.51
60-74	35	18.4	14	40.0	21	60.0	2.21	0.80 – 6.11
Total	**190**	**100.0**	**56**	-	**134**	-	-	-

- $(X^2 = 3.02; df = 3; p = 0.388)$

As shown in Table 5.3.1, the proportion of non-compliant patients were more in the age group of 60 – 74 years (40.0%), 30 – 44 years (30.5%), and 45 – 59 years (27.5%) than younger age group of people that is, 15 – 29 years (23.2%) of age. Factor that might be responsible for more rate of noncompliance among the older age group of people than the younger group of people was with the increase of age people became more weak due to their diseased conditions which hindered their frequent freely movement to outsides alone. In the study no significant association was found between treatment outcome and the age of the tuberculosis patients (p = 0.388).

Table 5.3.2 Effects of Sex on Treatment Outcome among TB Patients

Sex	Total		Outcome				Odds ratio	95% CI
	No	%	Non-compliant		Compliant			
			No	%	No	%		
Male	130	68.4	34	26.2	96	73.8	1	---
Female	60	31.6	22	36.7	38	63.3	1.63	0.84 – 3.14
Total	**190**	**100.0**	**56**	-	**134**	-	-	-

- (Fisher's Exact test p-value = 0.171)

As shown in Table 5.3.2, that female patients failed to comply treatment more (36.7%) than male (26.2%) which might be due to social, cultural and religious barriers persisting in the community that prevented the female patients from going outsides easily than their male counter parts. Statistically no significant association was found between treatment outcome and sex of the patients (p = 0.171).

Table 5.3.3 Effects of Marital Status on Treatment Outcome among TB Patients

Marital status	Total		Outcome				Odds ratio	95% CI
	No	%	Non-compliant		Compliant			
			No	%	No	%		
Unmarried	34	17.9	6	17.6	28	82.4	1	---
Married	156	82.1	50	32.1	106	67.9	2.20	0.85 – 5.65
Total	**190**	**100.0**	**56**	-	**134**	-	-	-

- (Fisher's Exact test p-value = 0.102).

As shown in Table 5.3.3 that married patients non-complied treatment more (32.1%) than the single / unmarried patients (17.6%) because of their more social and familial responsibilities than the unmarried one which prevented them to seek treatment regularly

and timely. No significant association was found between treatment outcome and the marital status of the tuberculosis patients (p = 0.102)

Table 5.3.4 Effects of Education on Treatment Outcome among TB Patients

Education	Total		Outcome				Odds ratio	95% CI
	No	%	Non-compliant		Compliant			
			No	%	No	%		
Literate	118	62.1	22	18.6	96	81.4	1	---
Illiterate	72	37.9	34	47.2	38	52.8	3.90	2.02 – 7.51
Total	**190**	**100.0**	**56**	-	**134**	-	-	-

- (Fisher's Exact test p-value < 0.001).

As shown in Table 5.3.4 that 47.2% Illiterate patients failed to comply treatment which was 18.6% for the literate patients. Illiterate patients had to non-comply treatment 3.90 times (95% CI, 2.02 to 7.51) more than the literate patients (p < 0.001). This might be that Illiterate patients were less conscious about their health status than literate patients, which made them more prone to non-comply treatment.

Table 5.3.5 Effects of Occupation on Treatment Outcome among TB Patients

Occupation	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Self business	49	25.8	9	18.4	40	81.6	1	---
Farmer/agriculture	63	33.2	16	25.4	47	74.6	1.51	0.55 – 4.20
House wife	38	20.0	15	39.5	23	60.5	2.90	0.99 – 8.61
Day labor	40	21.0	16	40.0	24	60.0	2.96	1.03 – 8.68
Total	**190**	**100.0**	**56**	-	**134**	-	-	-

- (X^2 = 7.37; df = 3; p = 0.061).

As shown in Table 5.3.5 that day labor group of people and the house wives were more non-compliant to treatment (40.0% and 39.5%) than those who were farmer / agriculture and self business groups (25.4% and 18.4%). This might be that day labor people had to go outside daily for their earnings in order to earn their livelihood. So, they might miss appointment due to this problem and were the victims of noncompliance of treatment. Similarly, the house wives had to look after their husband, children, father, mother and other members of the family, had to cook and spent most of the times busy with other familial jobs in a rural community in Bangladesh. So, they might forget taking drugs and even miss hospital appointment due to those problems.. No significant association was found between treatment outcome and the occupational status of the tuberculosis patients (p = 0.061).

Table 5.3.6 Effects of Religion on Treatment Outcome among TB Patients

Religion	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Muslim	154	81.1	44	28.6	110	71.4	1	---
Hindu	36	19.9	12	33.3	24	66.7	1.25	0.57 – 2.71
Total	190	100.0	56	-	134	-	-	-

- (Fisher's Exact test p-value = 0.551).

As shown in Table 5.3.6 that the Hindus failed to comply treatment more (33.3%) than the Muslims (28.6%). No significant association was found between treatment outcome and different religions of the tuberculosis patients (p = 0.551).

Table 5.3.7 Effects of Monthly Family Income on Treatment Outcome among TB Patients

Monthly income (in Takas)	Total		Outcome				Odds ratio	95% CI
	No	%	Non-compliant		Compliant			
			No	%	No	%		
6001 – 9000	45	23.7	4	8.9	41	91.1	1	---
3000 - 6000	145	76.3	52	35.9	93	64.1	5.73	1.94 – 16.89
Total	190	100.0	56	-	134	-	-	-

- (Fisher's Exact test p-value < 0.001).

Table 5.3.7 shows that patients whose monthly family income were less (between 3000- 6000 Takas) failed to comply treatment more (35.9%) than those whose monthly family income were 6001-9000 Takas (8.9%). The result showed that patients whose family's monthly income was 3000 – 6000 Takas had to non-comply 5.73 times more (95% CI, 1.94 – 16.89) than those patients whose family's monthly income was between 6001 – 9000 takas (p < 0.001). This might be that lower class income group of people had to go outside everyday for work for their earnings but the upper class income group of people need not to think about their financial matter so much like the lower class income group as they were the well to do group of people of the society.

5.4 Effects of Access barrier factors on Treatment Outcome among TB Patients

Table 5.4.1 Effects of Distance on Treatment Outcome among TB Patients

Outcome	Total number	Distance (In kilometers)		T - Test	P value
		Mean	SD		
Compliant patients	134	7.43	2.59	- 2.004	0.046
Non-compliant patients	56	8.29	2.95		
Total	190	7.68	2.72		

As shown in Table 5.4.1, tuberculosis patients who complied treatment had the mean score of distance (from home to hospital) of 7.43 $\pm$2.59 kilometers and those who failed to comply treatment had the mean score of distance of 8.29 $\pm$ 2.95 kilometers. A significant association was found between the distance from patient's home to hospital and the outcome of anti-tubercular treatment (p = 0.046). Thus the study finding suggested that long distance from home to hospital had an impact on noncompliance of treatment.

Table 5.4.2 Effects of Difficulty faced due to Distance on Treatment Outcome among TB Patients

Difficulty faced	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Faced no difficulty	141	74.2	21	14.9	120	85.1	1	---
Faced difficulty	49	25.8	35	71.4	14	28.6	14.28	6.58 – 30.97
Total	190	100.0	56	-	134	-	-	-

- (Fisher's Exact test p-value < 0.001).

As shown in Table 5.4.2, 74.2% patients reported that they faced no difficulty while 25.8% patients faced difficulty due to the distance from their home to hospital. Those who faced difficulty failed to comply treatment more (71.4%) than those who faced no difficulty (14.9%). Patients who faced difficulty due to distance from their home to hospital had an Odds ratio of 14.28 times more (95% CI, 6.58 – 30.97) noncompliance of treatment than those who faced no difficulty. There was a significant association between treatment outcome and the difficulty faced by the patients due to the distance (p < 0.001).

Table 5.4.3 Effects of Time took to Visit Hospital on Treatment Outcome among TB

Patients

Time took to visit hospital	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
1 hour	148	77.9	20	13.5	128	86.5	1	---
> 1 hour	42	22.1	36	85.7	6	14.3	38.40	14.34 – 102.76
Total	190	100.0	56	-	134	-	-	-

* (Fisher's Exact test p- value < 0.001).

As shown in Table 5.4.3 that 77.9% patients had to take 1 hour to visit hospital during their period of treatment and only 22.1% patients had to take >1hour to visit. Those patients who had to take > 1 hour to visit hospital failed to comply treatment more (85.7%) than those who took 1 hour (13.5%) to visit. Patients who took > 1 hour to visit hospital had to non-comply 38.40 times more (95% CI, 14.34 – 102.76) than those who took 1 hour to visit (p < 0.001).

Table 5.4.4 Effects of Visit by the Health Worker on Treatment Outcome among TB

Patients

Visit by health worker	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Once or twice biweekly and once monthly	105	55.3	21	20.0	84	80.0	1	---
Never visited	85	44.7	35	41.2	50	58.8	2.80	1.47 – 5.33
Total	190	100.0	56	-	134	-	-	-

- (Fisher's Exact test p- value = 0.002)

As shown in Table 5.4.4, 44.7% patients responded that they were never visited by the health worker during their period of treatment while 55.3% reported that health worker visited them once or twice biweekly and once monthly. This is contradictory to the DOTS Strategy under National TB control Program because it is mandatory that under DOTS strategy health workers should visit the patient's house regularly and routinely and look after the daily intake of drugs by the patients. It was also found that patients who were never visited by the health worker failed to comply treatment more (41.2%) than those who were visited once or twice biweekly and monthly (20.0%). Patients who were never visited by the health worker during treatment non-complied 2.80 times more (95% CI, 1.47 − 5.33) than those who were visited by the health workers at different times (P = 0.002). This suggested that visit by the health worker must be increased to reduce the rate of noncompliance among TB patients.

Table 5.4.5 Effects of Hospital Appointment on Treatment Outcome among TB Patients

Hospital appointment	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Never missed	95	50.0	5	5.3	90	94.7	1	---
Missed one or more times	95	50.0	51	53.7	44	46.3	20.86	7.77 – 55.96
Total	190	100.0	56	-	134	-	-	-

- (Fisher's Exact test p- value < 0.001).

As shown in Table 5.4.5, half of the total TB patients (50%) reported that they never missed appointment with the doctor / staffs in the hospital as per schedule date. Similarly

50.0% patients reported that they missed their date of hospital appointment one or more times during the treatment period.

Only 5.3% patients failed to comply treatment among the patients who never missed hospital appointment. On the other hand 53.7% patients non-complied who missed appointment for one or more times. Patients who missed hospital appointment for one or more times had to non-comply 20.86 times more (95% CI, 7.77 – 55.96) than those who never missed their appointment with the hospital authority (P < 0.001). This finding suggested that to reduce the missing of hospital appointment by the patients regular and timely presence of service providers in the tuberculosis department of hospital must be ensured.

Table 5.4.6 Effects of Type of Problem Faced from the Hospital Authority on Treatment Outcome among TB Patients

Problem faced	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Felt no problem/ Cooperated completely	107	56.3	4	3.7	103	96.3	1	---
Charged money	21	11.1	9	42.9	12	57.1	19.31	4.47 –90.27
Did not behave well	36	18.9	24	66.7	12	33.3	51.50	13.69 – 213.86
Supplied drugs poorly & irregularly	26	13.7	19	73.1	7	26.9	69.89	16.21 – 339.38
Total	190	100.0	56	-	134	-	-	-

- $(X^2 = 83.64; df = 3; p < 0.001)$.

As shown in Table 5.4.6 that 56.3% patients reported, they never felt any problem, rather received cooperation from the hospital authority. But 43.7% patients reported some sorts of non-cooperation from hospital authority.

Patients who reported that the hospital authority did not behave well with them had to non-comply 51.50 times more (95% CI, 13.69 – 213.86) than those who felt no problem. Similarly patients who informed that they were charged money for treatment by the hospital authority non-complied 19.31 times more (95% CI, 4.47 – 90.27) than those who never felt any problem. Lastly, patients who informed that they were supplied drugs irregularly and poorly non-complied 69.89 times more (95% CI, 16.21 – 339.38) than those who felt no problem from the hospital authority (p < 0.001). From the above findings it might be concluded that attitude of the service providers must be changed towards providing better service to the patients and they should be sympathetic to the patients when providing service. At the same time regular, adequate and free supply of drugs must be ensured to the patients according to the guidelines of the tuberculosis control program.

Table 5.4.7 Effects of buying drugs on Treatment Outcome among TB Patients

Buying drugs	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Need not to buy drugs	150	78.9	25	16.7	125	83.3	1	---
Had to buy drugs	40	21.1	31	77.5	9	22.5	17.22	7.30 – 40.59
Total	190	100.0	56	-	134	-	-	-

• (Fisher's Exact test p-value < 0.001).

Table 5.4.7 shows that more than three- fourths of the TB patients (78.9%) reported, they need not to buy anti-tubercular drugs during their treatment while 21.1% patients informed that they had to buy drugs from outside. 77.5% patients failed to complete treatment among the patients who reported that they had to buy anti tubercular drugs. Patients who had to buy drugs from outside non-complied 17.22 times more (95% CI, 7.30 – 40.59) than those who need not to buy drugs from outside (p < 0.001). So, the above findings suggested that supply of anti tubercular drugs must be regular and its stock in the hospital should be at optimum level at all times if the rate of noncompliance was to be reduced.

Table 5.4.8 Effects of Development of Symptoms on Treatment Outcome among TB Patients

Symptom	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Developed no symptom	81	42.6	5	6.2	76	93.8	1	---
Drug reactions	40	21.1	14	35.0	26	65.0	8.18	2.43 – 29.18
Loss of appetite	20	10.5	8	40.0	12	60.0	10.13	2.45 – 44.08
Nausea and vomiting	49	25.8	29	59.2	20	40.8	22.04	6.92 – 75.06
Total	190	100.0	56	-	134	-	-	-

- $(X^2 = 43.61; df = 3; p < 0.001)$.

As shown in Table 5.4.8, 42.6% patients reported that they developed no physical symptom due to intake of drugs and 57.4% reported that they developed some sorts of physical problems due to intake of anti-tubercular drugs. Among them 21.1% developed drug reactions, who were transferred to another regimen of drugs later on, 10.5%

developed loss of appetite and 25.8 % patients developed nausea and vomiting. Patients who developed loss of appetite due to intake of anti tubercular drugs non-complied 10.13 times more (95% CI, 2.45 – 44.08) than those who developed no symptom. Patients who developed drugs reactions had to non-comply 8.18 times more (95% CI, 2.43 – 29.18) than those who developed no symptom. Lastly, those who developed nausea and vomiting non-complied 22.04 times more (95% CI, 6.92 – 75.06) than those who developed no symptom due to intake of anti tubercular drugs (p < 0.001). This findings suggested that continuous and regular follow up to the patients were necessary and mandatory by the service providers when the patients were under anti tubercular treatment so that prompt measure might be undertaken if any patient developed problems due to drug intake. That measure would help to reduce the rate of noncompliance among tuberculosis patients.

5.5 Effects of Need factors on Treatment Outcome among TB Patients

Table 5.5.1 Effects of Clinical Improvement on Treatment Outcome among TB Patients

Clinical improvement	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Felt improvement	146	76.8	21	14.4	125	85.6	1	---
Failed to improve clinically	44	23.2	35	79.5	9	20.5	23.14	9.73 – 55.04
Total	190	100.0	56	-	134	-	-	-

- (Fisher's Exact test p-value < 0.001).

As shown in Table 5.5.1, 76.8% patients reported that they felt clinically improved after taking anti-tubercular drugs and among them 14.4% patients non-complied

treatment assuming that they had been cured. On the other hand a small number of patients (23.2%) felt no clinical improvement after taking drugs and due to this a large proportion of them (79.5%) non-complied treatment. Patients who felt no clinical improvement during treatment had to non-comply 23.14 times more (95% CI, 9.73 to 55.04) than those who felt clinical improvement during treatment (p < 0.001). This suggested that patients were not properly motivated and briefed by the service providers about the course of the disease and duration of anti tubercular treatment, which was needed to be strengthened in order to reduce the rate of noncompliance among TB patients.

Table 5.5.2 Effects of forgetting drugs on Treatment Outcome among TB Patients

Forgot to take drugs	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Never forgot	51	26.8	0	00.0	51	100.0	1	---
Once a day	84	44.2	12	14.3	72	85.7	1.70	0.51 – 5.94
Once a week	32	16.8	23	71.9	9	28.1	26.07	6.94 – 106.18
> Once a week	23	12.1	21	91.3	2	8.7	107.10	16.32 – 942.54
Total	190	100.0	56	-	134	-	-	-

As shown in Table 5.5.2 that 44.2% patients forgot to take drugs once a day, 16.8% forgot to take drugs once a week and 12.1% patients forgot more than once a week. On the other hand 26.8% patients reported that they never forgot to take drugs. The proportion of noncompliance were more among those patients who forgot to take drugs > once a week (91.3%) and once a week (71.9%) than those who forgot once a day (14.3%) and never forgot (0.0%). Patients who forgot to take drugs once a week non-

complied 26.07 times more (95% CI, 6.94 – 106.18) than those who never forgot. Lastly, patients who forgot > once a week had to non-comply 107.10 times more (95% CI, 16.32 –942.54) than those who never forgot to take drugs. So, these results indicated that proper follow up either by the service providers (health assistants) or by the responsible family members of the patients were not done which was contradictory to the guidelines of tuberculosis control program.

Table 5.5.3 Effects of action taken after forgetting drugs on Treatment Outcome among TB Patients.

Outcome	Total	Action taken		
		Took next day	Extended treatment duration	Did not take at all
Non-compliant	56	0 (00.0%)	29 (51.8%)	27 (48.2%)
Compliant	83	72 (86.7%)	7 (8.4%)	4 (4.8%)
Total	139	72 (51.8%)	36 (25.9%)	31 (22.3%)

Table 5.5.3 shows that 139 patients responded to the question about the action taken after forgetting to take drugs at different times. The idea was to know whether the patient was acquainted with the proper action after forgetting drugs. 86.7% of the compliers and none of the non-compliers took the forgotten doses next day. 51.8% of the non-compliant respondent's and 8.4% of the compliant respondent's treatment duration were extended. 48.2% of the non-compliers and 4.8% compliers did not take the drugs at all.

Table 5.5.4 Effects of Confidence on Hospital Treatment on Treatment Outcome

Among TB Patients

Confidence	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Had confidence	118	62.1	6	5.1	112	94.9	1	---
Had no confidence	72	37.9	50	69.4	22	30.6	42.42	16.20 – 111.05
Total	190	100.0	56	-	134	-	-	-

- (Fisher's Exact test p-value < 0.001).

Table 5.5.4 shows that out of 190 patients, 62.1% had confidence and 37.9% had no confidence on hospital treatment. The proportion of non-compliant patients were more among those who had no confidence (69.4%) and 5.1% non-complied among those patients who had confidence on hospital treatment. Patients who had no confidence on hospital treatment had to non-comply 42.42 times more (95% CI, 16.20 – 111.05) than those who had confidence on hospital treatment (p < 0.001). So this finding provided an outlook about the acceptability of the service delivery system under DOTS strategy in Bangladesh. Service providers should be more kind and sympathetic to the patients during providing service to them in order to increase the confidence levels of the patients.

Table 5.5.5 Effects of Alternative Treatment on Treatment Outcome among TB

Patients

Alternative treatment	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Did not receive alternative treatment	123	64.7	7	5.7	116	94.3	1	----
Received alternative treatment	67	35.3	49	73.1	18	26.9	45.11	17.71 – 114.87
Total	190	100.0	56	-	134	-	-	-

- (Fisher's Exact test p-value < 0.001).

As shown in Table 5.5.5, 64.7% patients did not receive alternative treatment. Among the 67 patients (35.3%) who received alternative treatment, the proportion of noncompliance were more in them (73.1%) than those who did not receive alternative treatment (5.7%). Patients who received alternative treatment non-complied 45.11 times more (95% CI, 17.71 – 114.87) than those who never received alternative treatment (p < 0.001).

Table 5.5.6 Effects of Place of Alternative Treatment on Treatment Outcome among

TB Patients

Place of alternative treatment	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Village doctor	19	28.4	10	52.6	9	47.4	1	---
General physician	25	37.3	20	80.0	5	20.0	3.60	0.80 – 17.04
Other hospital	23	34.3	19	82.6	4	17.4	4.28	0.88 – 22.37
Total	67	100.0	49	-	18	-	-	-

- $(X^2 = 5.71; df = 2; p = 0.057)$

As shown in Table 5.5.6, among 67 patients who also received treatment from other places during their anti-tubercular treatment from the hospital, 28.4% of them received treatment from village doctor, 37.3% received treatment from general physician, and 34.3% from other hospital. Among the alternative treatment receivers, 82.6% failed to complete treatment who went to other hospital for treatment, followed by those who also received treatment from general physician (80.0%) and village doctor (52.6%). No association was found between treatment outcome and place of alternative treatment (p = 0.057).

5.6 Effects of Social barrier factors on Treatment Outcome among TB Patients

Table 5.6.1 Effects of Change of Residence on Treatment Outcome among TB Patients

Change of Residence	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Did not change residence	157	82.6	29	18.5	128	81.5	1	---
Changed residence	33	17.4	27	81.8	6	18.2	19.86	7.51 – 52.50
Total	190	100.0	56	-	134	-	-	-

- (Fisher's Exact test p-value < 0.001).

As shown in Table 5.6.1, most of the patients (82.6%) did not change residence during their treatment period while 17.4% patients moved residence during their anti-tubercular treatment. The proportion of patients failed to complete treatment were more among those who moved residence during treatment (81.8%) than those who never moved residence during their period of treatment (18.5%). An association was found

between treatment outcome and the change of residence / homelessness by the tuberculosis patients (p < 0.001). Patients who moved residences during treatment non-complied 19.86 times more (95% CI, 7.51 - 52.50) than those who did not move their residences during anti tubercular treatment.

Table 5.6.2 Effects of Family Support on Treatment Outcome among TB Patients

Family support	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Received support	150	78.9	20	13.3	130	86.7	1	---
Did not receive Family support	40	21.1	36	90.0	4	10.0	58.50	18.80 – 182.04
Total	190	100.0	56	-	134	-	-	-

- (Fisher's Exact test p-value < 0.001).

As shown in Table 5.6.2, that more than three-fourths of the patients (78.9%) received support from their families during treatment while 21.1% patients failed to receive support. The proportion of patients who failed to complete treatment were more (90%) among those who failed to receive support from their families than those who received support from their families (13.3%). Significant association was found between treatment outcome and support by the family members upon tuberculosis patients (p < 0.001). Patients who failed to receive family support non-complied 58.50 times more (95% CI, 18.80 to 182.04) than those who received support from their families which proved the necessity of psychosocial aspect of the treatment care for the patients by their family members.

Table 5.6.3 Effects of Support by the Family members on Treatment Outcome

Among TB Patients

Supported by	Total		Outcome				Odds ratio	95% CI
			Non-compliant		Compliant			
	No	%	No	%	No	%		
Father/Mother/ Brother/Sister and Children	94	62.7	11	11.7	83	88.3	1	---
Husband / Wife	56	37.3	9	16.1	47	83.9	1.44	0.55 – 3.73
Total	150	100.0	20	-	130	-	-	-

- (Fisher's Exact test p-value = 0.465).

As shown in Table 5.6.3 that among 150 patients who received support from their families during treatment 62.7% were supported either by father/mother, brother/sister or children and 37.3% were supported by husband or wife. No significant association was found between treatment outcome and support by different family members of the tuberculosis patients (p = 0.465).

Table 5.7 Summary table for different significant factors affecting noncompliance of treatment among TB patients (Bivariate Analysis)

Factors	Total		Noncompliant patients		p-value	Odds ratio	95% CI
	No	%	No.	%			
Socioeconomic **Education** Literate Illiterate	118 72	62.1 37.9	22 34	18.6 47.2	P < 0.001	1 3.90	2.02 – 7.51
Monthly income 6001 – 9000 Taka 3000 – 6000 Taka	45 145	23.7 76.3	4 52	8.9 35.9	P < 0.001	1 5.73	1.94 – 16.89
Access barrier factors Effects of distance on treatment outcome	--	--	--	--	P = 0.046 (T- Test)	---	---
Difficulty faced Faced no difficulty Faced difficulty	141 49	74.2 25.8	21 35	14.9 71.4	P < 0.001	1 14.28	6.58 – 30.97
Time took to visit hospital 1 hour > 1 hour	148 42	77.9 22.1	20 36	13.5 85.7	P < 0.001	1 38.40	14.34 – 102.76
Visit by health worker Once or twice biweekly & once monthly Never visited	105 85	55.3 44.7	21 35	20.0 41.2	P = 0.002	1 2.80	1.47 – 5.33
Missing hospital appointment Never missed Missed one or more times	95 95	50.0 50.0	5 51	5.3 53.7	P < 0.001	1 20.86	7.77 – 55.96

Table 5.7 Summary table for different significant factors affecting noncompliance of treatment among TB patients (Continued).

Factors	Total		Noncompliant patients		p-value	Odds ratio	95% CI
	No	%	No.	%			
Problem faced					P < 0.001		
Felt no problem	107	56.3	4	3.7		1	
Charged money	21	11.1	9	42.9		19.31	4.47 – 90.27
Not behaved well	36	18.9	24	66.7		51.50	13.69 – 213.86
Poor drug supply	26	13.7	19	73.1		69.89	16.21 – 339.38
Buying drugs					P < 0.001		
Need not to buy drugs	150	78.9	25	16.7		1	
Had to buy drugs	40	21.1	31	77.5		17.22	7.30 – 40.59
Development of symptoms					P < 0.001		
Develop no symptom	81	42.6	5	6.2		1	
Drug reactions	40	21.1	14	35.0		8.18	2.43 – 29.18
Loss of appetite	20	10.5	8	40.0		10.13	2.45 – 44.08
Nausea &vomiting	49	25.8	29	59.2		22.04	6.92 – 75.06
Need factors **Clinical improvement**					P < 0.001		
Felt clinical improvement	146	76.8	21	14.4		1	
Failed to improve clinically	44	23.2	35	79.5		23.14	9.73 – 55.04
Confidence on hospital treatment					P < 0.001		
Had confidence	118	62.1	6	5.1		1	
Had no confidence	72	37.9	50	69.4		42.42	16.20 – 111.05
Alternative treatment					P < 0.001		
Did not receive alternative treatment	123	64.7	7	5.7		1	
Received alternative treatment	67	35.3	49	73.1		45.11	17.71 – 114.87
Social barrier factors **Moved residence**					P< 0.001		
Did not moved residence	157	82.6	29	18.5		1	
Moved residence	33	17.4	27	81.8		19.86	7.51 – 52.50
Family support					P< 0.001		
Received family support	150	78.9	20	13.3		1	
Did not receive family support	40	21.1	36	90.0		58.50	18.80 – 182.04

5.8 Multivariate Analysis

The different significant factors found to be associated with noncompliance of treatment among tuberculosis patients by Bivariate analysis were used for Multivariate analysis. This is because controlling for other variables in contingency tables requires dividing the total sample size into many smaller tables containing subgroups. Multivariate analysis uses all of the significant factors in the analysis and therefore is more efficient than in contingency table analysis. The usual purpose of multivariate analysis is to understand how important, both individually and when acting together, the independent variables are for explaining the variation in the dependent or outcome variable.

5.8.1 Procedures for selecting model of Multivariate analysis

The choice of an appropriate statistical method for multivariate analysis depends on whether the dependent and independent variables are continuous, ordinal, dichotomous or nominal. If the dependent variable is dichotomous and the independent variables are categorical or continuous the correct multivariable technique used is " Multiple Logistic Regression Model."

So, in this study multiple logistic regression analysis was used, as the dependent variable was dichotomous and the independent variables (significant) were categorical to find out the factors which were associated with noncompliance of treatment among sputum smear positive tuberculosis patients. Backstep logistic regression analysis was used because the strategy followed in this model that it works backwardly from the largest starting model to a smaller final model by treating different variables at different

steps and also by eliminating unnecessary variables at each step. The idea is that, each variable is evaluated in terms of its contribution to a model that already contains all other variables. When the significance level of a variable (p value) is not found to meet a preset standard (that is, when the p value is above the preset value) the variable is removed from the equation. All statistics are then computed for the new reduced model and the remaining variables are screened to see if they meet the significance standard. When a variable is found to have a higher p-value than required, the variable is dropped from the equation. The process continues until all variables left in the equation are found significant in terms of p-value. This model also helps to estimate the Odds ratio with 95% confidence interval.

In the study fourteen significant variables which were found to have statistically significant association (p < 0.05) on noncompliance of treatment among sputum smear positive tuberculosis patients by bivariate analysis were included in the logistic model (Table 5.5). Among them five factors were found to have statistically significant association with noncompliance of treatment among tuberculosis patients. They were time took by the patients to visit the hospital from their home, buying drugs by the patients from outside during treatment, move residence, family support by the patients during treatment and symptoms developed by the patients due to taking of anti tubercular drugs.

Table 5.8.2 Result of " Multiple Logistic Regression" Analysis

Factors	Odds Ratio	95% CI	P value
Access barrier factors			
1. Time took to visit the hospital from patient's home.			
• 1 hour	1		$P < 0.001$
• > 1 hour	455.80	36.73 – 5654.83	
2. Buying drugs from outside during treatment in the hospital			
• Need not to buy drugs	1		$P < 0.001$
• Had to buy drugs	117.79	9.33 – 1485.86	
3. Development of symptoms due to intake of anti tubercular drugs			
• Developed no symptom	1		$P < 0.001$
• Developed symptoms	31.18	4.49 – 216.34	
Social barrier factors			
4. Moved residence			
• Did not move residence	1		$P = 0.022$
• Moved residence	14.30	1.46 – 139.62	
5. Family support during treatment			
• Received family support	1		$P < 0.001$
• Did not receive family support	72.18	7.24 – 719.59	

From the table 5.8.2, it was found that patients who took more than one hour to visit hospital during treatment had a significant effect on noncompliance of treatment. The result showed that who took more than one hour to visit hospital had to non-comply 455.80 times more (95% CI, 36.73 – 5654.83) than those who took one hour to visit hospital (p < 0.001).

Regarding buying drugs from outsides by the patients during their treatment in the hospital it was found that patients who had to buy anti tubercular drugs from outside, non-complied 117.79 times more (95% CI, 9.33 – 1485.86) than those who need not to buy drugs from outside (p < 0.001).

Logistic regression analysis showed that patients who developed physical symptoms due to intake of anti tubercular drugs (eg, Loss of appetite., nausea and vomiting, diarrhoea, hepatitis, skin reactions etc) non-complied treatment 31.18 times more (95% CI, 4.49 – 216.34) than those who developed no symptom after taking anti tubercular drugs (p < 0.001).

Patients who moved residences during treatment non-complied 14.30 times more (95% CI, 1.46 – 139.62) than those who did not move their residences during treatment (p = 0.022)

An another important factor found in the logistic regression analysis was family support received by the patients during their treatment. Patients who failed to receive family support during treatment non-complied 72.18 times more (95% CI, 7.24 – 719.59) than those who received support from their family members at the time of treatment (p < 0.001).