

# Illness Perception & Anxiety Depression among the Multi-Drug Resistant Tuberculosis Patients: A Cross Sectional Study

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## Abstract

As the prevalence of multi-drug resistant tuberculosis (MDR-TB) is increasing all over the world including Bangladesh over the last several decades, there has been a growing concern of their treatment adherence and subsequent outcome. Though illness perception, anxiety and depression are directly or indirectly related to the therapy-adherence and outcome of MDR-TB, no study has been carried out on this ground in Bangladesh so far. We aimed to determine the extent of depression and anxiety and the state of illness perception among the patients suffering from MDR-TB in Bangladesh. Total 106 hospitalized patients with MDR-TB completed the Hospital Anxiety and Depression Scale (HADS) and the Revised Illness Perception Questionnaire (IPQ-R). Out of 106 patients, 47 (44.3%) were depressed and 53 (50.0%) had anxiety. Raised depression and anxiety scores were associated with an increase in the number of symptoms reported (HADS Depression:  $r = 0.345$ ,  $p < 0.001$ ), more serious perceived consequences (HADS Depression:  $r = 0.278$ ,  $p = 0.004$ , HADS Anxiety:  $r = 0.235$ ,  $p = 0.017$ ) and less control over their illness (HADS Depression:  $r = 0.237$ ,  $p = 0.013$ , HADS Anxiety:  $r = 0.272$ ,  $p = 0.005$ ). It is revealed that, about half of the patients met the criteria for probable depression and anxiety based on HADS score. Negative illness perceptions were clearly related to the reports of psychological upset symptoms. As depression and lack of perceived control over illness are reported to be linked to poor treatment adherence, further detailed studies to investigate their association with treatment adherence are required.

**Key words:** MDR-TB, Illness perception, Anxiety, Depression, HADS, IPQ-R.

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## Introduction

Tuberculosis (TB) is a major public health problem in Bangladesh. In 2008, the World Health Organization (WHO) ranked Bangladesh

sixth among the world's 22 high-burden TB countries. In 2007, there were an estimated 353,103 new cases, 1,587,797 of which were sputum smear-positive TB cases; more than 70,900 were TB-related deaths.<sup>1</sup>

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In 2009, there were 365,000 new cases, prevalence rate and death rate was 426 and 51 respectively of all forms of TB per 100,000 population.<sup>2</sup>

TB, an infectious disease caused by *Mycobacterium tuberculosis* is a serious global health problem and requires much attention to stop TB cases globally. Its severity cannot be underestimated as a single patient of TB can infect ten or more patients in a year. Modern Anti-TB treatment can cure virtually all patients of tuberculosis. It is very important that treatment must be taken for the prescribed duration which is usually for six months. However, the treatment is often interrupted due to long duration of the regime and also as the patient feels better after one to two months of therapy. Apart from this, other factors that lead

to patient's non compliance are ignorance, poverty, unemployment, illiteracy. Hence, these subgroups of patients are not cured completely and remain infected spreading the disease further in the community.<sup>3</sup>

**Multi-drug-resistant (MDR) and extensively drug-resistant (XDR) tuberculosis (TB) threaten effective treatment and undermine global efforts towards elimination of TB.**<sup>4</sup>

**One of the main causes of treatment failure and rise in the prevalence of TB is due to poor treatment adherence.**<sup>5</sup>

**TB is curable and curing TB patients is the best way to prevent its spread. Left untreated, each person with active TB disease will infect on average between 10 and 15 people every year. However, people infected with TB bacilli will not necessarily become sick with the disease. The immune system "walls off" the TB bacilli which, protected by a thick waxy coat, can lie dormant for years. When someone's immune system is weakened, the chances of becoming sick are greater. Usually 5-10% of people who are infected with TB bacilli (but who are not infected with HIV) become sick or infectious at some time during their life time. People with HIV and TB infection are much more likely to develop active TB.**<sup>6</sup>

**Several studies revealed that, anxiety, depression and illness perception greatly influences the treatment adherence and outcome of any chronic disease.**<sup>7, 8</sup>

**A number of studies have shown that when patients hold generally negative illness perceptions about their illness (e.g. a large number of symptoms associated with the condition, more severe consequences, longer timeline beliefs) these perceptions are associated with increased future disability and a slower recovery, independent of the initial medical severity of the condition.**<sup>9, 10, 11</sup>

**Some researches on illness perceptions have confirmed that patients' beliefs are associated with important outcomes in a broadening range of illnesses and risk factor testing. New interventions based on this model have the potential to improve patient outcomes.**<sup>12</sup>

So it is necessary to address illness perception and anxiety-depression among these patients. By improving illness perception and psychological status, it is possible to enhance the treatment success among MDR-TB patients. The findings of the study can be utilized to comprehend the situation and to take further necessary measures and subsequently contribute in reducing the burden of this disease.

The study objective was to determine the level of anxiety, depression and illness perception among multi-drug resistant tuberculosis patients.

#### **Materials and Methods:**

National Institute of Diseases of the Chest and Hospital (NIDCH) is a state supported research institute and teaching hospital in Dhaka, Bangladesh. It provides specialized treatment for all types of chest diseases especially tuberculosis including drug resistant tuberculosis. Admitted indoor patients with diagnosed MDR-TB were approached. Subjects were excluded if they were less than 18 years old, or if they suffered from any major psychiatric disorder other than anxiety or depression. Those with other coexisting physical illness were also excluded in order to avoid the confounding influence of these factors on psychological well being. Whilst taking rest in the hospital beds at day time, all patients were approached and details of the study provided to them. Those giving verbal informed consent were invited to complete a questionnaire to record demographic characteristics and information regarding illness perception and anxiety-depression. Due to low levels of literacy amongst the patients and in order to maintain uniformity questionnaires were read to all patients with explanation in local language. The Bengali version of 14-item, self-rated Hospital Anxiety and Depression Scale (HADS) was used to record symptoms of anxiety and depression.<sup>13</sup>

This questionnaire was designed for use in patients with physical illnesses and avoids recording details of the biological symptoms of depression that might arise as a result of the physical complaints. Subscale scores provide a measure of both anxiety and depression as

continuous variables. Scores of 11 or above on the anxiety or depression subscale are taken as indicative of probable 'case ness' for either disorder. The revised Illness Perception Questionnaire (IPQ-R) was used to record patients' personal beliefs about TB.<sup>14</sup>

The IPQ-R assesses 5 dimensions of the personal beliefs relating to their illness: (1) symptom load ("Identity" subscale), (2) expected illness duration ("Timeline" subscale), (3) anticipated impact of illness – ("Consequences" subscale), (4) perceived potential for illness to be controlled/cured "Control/Cure" subscale) and (5) likely cause of the illness ("Cause" subscale). The latter cause subscale provides qualitative data and is excluded from our analysis. Culturally validated translation of IPQ-R into Bengali was developed based on published guidelines.<sup>15, 9</sup>

Statistical analysis was performed using SPSS 17.0 for windows. After confirming that key variables were normally distributed, the degree of linear association between variables was determined using Pearson's Correlation Coefficient (r). The independent effect of the variables considered on the presence of 'caseness' disorder was assessed by binary logistic regression analysis.

### Results:

Among the patients who met inclusion criteria, 106 consented to take part in this study. We have completed collection of data on these patients. The sample consisted of 69 (65.1%) males and the mean age of the total sample was 32.4 years. Total 26 (24.5%) patients were housewives and 34 (32.1%) had primary education. At the time of study, 75 (70.8%) subjects were married and 31 (29.2%) were single. Among the patients, 47 (44.3%) met study criteria for depression (HAD depression score  $\geq$  11) and 53 (50.0%) had anxiety (HAD anxiety score  $\geq$  11). HADS anxiety and HADS depression scores were not correlated (Pearson's Correlation Coefficient (r) = 0.92, p = 0.352). Raised depression and anxiety scores were associated with an increase in the number of symptoms reported, more serious perceived consequences and less control over the illness (table 1).

These associations continued to be significant when controlling for patients age, gender, marital and employment status (table 2).

Regression analyses were performed to identify variables associated with categorization of the patients as depressed or anxious (tables 3 and 4). The perception of greater symptom load was independently predictive of both depression and anxiety.

**Table-I**

*Association between mood and illness perceptions (Pearson's Correlation)*

	HADS Anxiety	HADS Depression
IPQ-R Identity	(r) = 0.311, p = < 0.001	(r) = 0.353, p = < 0.001
IPQ-R Time-line	(r) = 0.176, p = 0.067	(r) = 0.077, p = 0.421
IPQ-R Consequences	(r) = 0.282, p = 0.003	(r) = 0.307, p = 0.001
IPQ-R Control/Cure	(r) = 0.314, p = 0.001	(r) = 0.268, p = 0.005

**Table-II**

*Association between mood and illness perceptions controlling for age, gender, duration of illness and pulmonary and non-pulmonary infection (Pearson's Correlation)*

	HADS Anxiety	HADS Depression
IPQ Identity	(r) = 0.306, p = 0.002	(r) = 0.345, p = < 0.001
IPQ Time-line	(r) = 0.181, p = 0.067	(r) = 0.082, p = 0.414
IPQ Consequences	(r) = 0.235, p = 0.017	(r) = 0.278, p = 0.004
IPQ Control/Cure	(r) = 0.272, p = 0.005	(r) = 0.237, p = 0.013

**Table-III***Regression analysis of factors independently associated with depression in TB patients.*

Variable	OR (95% C.I.)	Significance (p-value)
Gender	1.07 (0.21–5.56)	0.924
Age	1.01 (0.98–1.04)	0.406
Marital status	0.93 (0.51–1.58)	0.845
Employment status	1.26 (0.25–6.57)	0.777
IPQ Identity	1.21 (1.06–1.38)	0.005
IPQ Time line	1.10 (0.90–1.34)	0.351
IPQ Consequences	1.11 (0.98–1.28)	0.111
IPQ Control	1.08 (0.95–1.20)	0.262

**Table-IV***Regression analysis of factors independently associated with anxiety in TB patients.*

Variable	OR (95% C.I.)	Significance (p-value)
Gender	0.82 (0.18–3.95)	0.814
Age	1.01 (0.98–1.04)	0.347
Marital status	1.44 (0.70–1.89)	0.595
Employment status	0.96 (0.20–4.63)	0.971
IPQ Identity	1.16 (1.02–1.31)	0.021
IPQ Time line	1.03 (0.94–1.12)	0.593
IPQ Consequences	1.08 (0.95–1.24)	0.221
IPQ Control	1.07 (0.96–1.21)	0.214

**Discussion:**

Poor treatment adherence in any disease has resulted not only in worse clinical outcomes, but also increased duration of hospital stay and increased health care costs.<sup>8, 16, 17</sup>

To date, there has been paucity of medical research literature that has focused on co-morbid depression and illness perception in drug resistant tuberculosis. Current study aimed to look at the prevalence of depression, anxiety and negative illness beliefs and perceptions in patients of MDR-TB. It was found that, prevalence of depression (44.3%) and anxiety (50%) in these MDR-TB patients is higher than usual. However, the results state that high depression and anxiety scores were associated with an increased number of symptoms reported, more serious perceived consequences and less control over the illness. This is important because these factors may contribute to poor compliance and adherence with their long term medication and compulsory

hospitalization. One of the limitations of the study is that it is cross sectional in design with no control group thus the casual relationships can only be inferred. However one of the strengths of this study is that it used validated and recognised tools to measure both illness perception and anxiety-depression. The sample size is small but out of the eligible patients we have included a considerably high proportion, which means that the sample was representative and the results is generalizable. These findings highlight the benefits of regular screening for depression in the admitted patients in the hospitals, particularly the patients with chronic diseases.

**Conclusion:**

Treating anxiety and depression and taking measures to improve their illness perceptions may help improve treatment adherence, disease outcomes and improve overall patient management. Taking into consideration low literacy levels and other cultural barriers new

treatment strategies should adopt psychotherapy and cognitive behavioural therapy to achieve these treatment adherence and outcomes. Fortunately there have been some trials undertaken for psychological treatments for the patients with depression in developing countries with encouraging results. The content and structure of these interventions can be modified to address anxiety, depression and illness perception to improve treatment adherence.

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