

DEPRESSION AMONG THE TUBERCULOSIS PATIENTS

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ABSTRACT

Aim to assess the level of depression in tuberculosis patients by depression scale PHQ-9. This cross-sectional study was conducted at National Institute of Chest Disease and Hospital (NIDCH) in Dhaka city. The patients mean age was 44.6 (± 13.86) years, male 60%, female 40%, and monthly family income was Tk 10040.82 (± 6393.38). Pulmonary TB was 57.6%. Taking first treatment 1.2 % from DOT centre and 1.2% from doctor's chamber. In family members 13% have present history of TB. Feeling shy on illness 38% and 58.4% trouble falling or staying asleep or sleeping too much. For several days 57.1% feeling tired or having little energy. Have poor appetite or overeating over the last two weeks 69.8% for several days. Only 0.8% thinking of suicide or hurting of yourself over the last two weeks. According to Mean PHQ-9 score (SD) 26.9% was mild depression and 73.1% moderate to severely depress. There was highly significant association found in between depression severity and sex of the patients $\chi^2 = 10.07$, $df=2$, $p=.007$ and highly significant association found in between depression severity and difficulty of any problem $\chi^2 = 54.04$, $df = 6$, $p=.000$. In tuberculosis depression is a silent driver and its leads resistance to TB infections..

Keywords: Tuberculosis, Tuberculosis patient, Extra-pulmonary tuberculosis, New case, Relapse, Assessment criteria of depression by PHQ-9 scale.

I. INTRODUCTION

Tuberculosis (TB) is a major global public health problem mostly in developing and under developed countries. Globally it is responsible for more than three million deaths each year and one of the leading causes of mortality worldwide (Joshi R et al.2006)¹. The world health organization (WHO) 2007 reported that one third of the world population that is approximately 2 billion people, is infected with Mycobacterium tuberculosis and there are about 8-10 million new active cases each year. Tuberculosis is particularly common among individuals with mood disorders e.g., anxiety and depression. Because of the frequent co-morbidity of TB and mood disorders; it is important for primary health care physicians, who treat TB patients to be mindful of the clinical manifestations of depression. Because of the highly infective nature of TB, psychiatrists should be aware of diagnostic and treatment considerations of this disease (Adam J et al.2016)². There were 8.8 million new cases of TB in 2005, the highest rates being in Africa (28% of all TB cases) and half of all new cases in six Asian countries namely Bangladesh, China, India, Indonesia, Pakistan and the Philippines (WHO, 2007)³.

Tuberculosis is a contagious and airborne disease caused by Mycobacterium tuberculosis. Worldwide, it is a leading cause of morbidity and mortality among adults. The disease is preventable and, in most cases, curable. Despite this, in 2007 an estimated 9.27 million persons newly acquired TB. Of these, 4.1 million (44%) were sputum smear-positive, which are more capable of spreading disease. TB incidence rates have declined or stabilized in five out of the six World Health Organization (WHO) regions between 1990 and 2007 (the exception is Europe, where rates are approximately stable). Yet at a global level, the total number of cases is increasing in absolute terms as a result of population growth. The majority of cases occur in 22 high-burdened countries in Africa, Southeast Asia, and the Western Pacific region. According to Development Agenda, 2015, Bangladesh ranks 6th globally in terms of the burden of TB on the population. According to the World Health

Organization, around 350,000 Bangladeshi's developed TB in 2013 and around 80,000 die from TB every year and about 190,000 new cases occur yearly (Anna V) ⁴.

It is now well established that the worsening trend of TB remains among the major public health problem. Another concern today is the problem of co- morbidity of TB with depression. Studies elsewhere have shown the magnitude of depression among TB patients to be high. Prevalence rates range from 19%-80 % as the following studies show Turkey 19 %-26 % (Aydin IO et al.2001)⁵, India 76 % (Mohamed A et al.2009)⁶, Pakistan 46.3 %-80 % (Husain M O et al.2008; Aamir S.2010)⁷⁻⁸, Nigeria 27.7 %-30 %, (Aniebue PN et al.2007; Issa, B A et al.2009; Erhabor, G. E et al.2000)^{9, 10, 11}, Ethiopia 64 % (Deribew A et al.2009)¹² and South Africa 46 % (Naidoo P et al.2010)¹³. The co morbidity of TB and depression is influenced by the interaction of social demographic characteristics, psychological factors, presence of physical illness and the nature TB of the disease.

Though available evidence is of mixed methodological quality, it suggests that the prevalence of depression among individuals with active TB may be equally high or higher than in people with other chronic medical conditions. However, more research is sorely needed to estimate the true community prevalence of depression among individuals with TB. Treating co-morbid depression has been associated with better TB outcomes, including medication adherence, treatment completion, and cure. A prospective controlled study in India found that TB patients who received individual psychotherapy during treatment were significantly more likely to adhere to and complete treatment and, thus, be cured of their disease (Janmeja AK et al.2005)¹⁴. Though TB disproportionately affects individuals in low resource settings with few mental health specialists, a growing body of evidence suggests that non-specialist health workers can be trained to deliver basic mental health care, including case detection, symptom management and triage, and such strategies may be very useful and relevant in the context of TB.

Very few studies have been found in our country about depression on tuberculosis patients. Although depression among tuberculosis patients is a major concern for physicians in the treatment of tuberculosis. This cross sectional study was undertaken with the research question was what are the levels of depression among the tuberculosis patient? And purpose to assess the level of depression among the tuberculosis patient and to explore the association between depression severity and socio-demographic characteristics of tuberculosis patients.

II. METHODOLOGY

This cross-sectional study was carried out for this investigation. Ethical approval of the research was taken from Institutional Review Board (IRB) of NIPSOM in due time. The participation was completely voluntary. Their right to refuse to participant in the study (if they wished so) was respected. Each respondent was interviewed separately and the study was not involved any physical, mental, societal risk to the participants. The study was conducted in OPD and IPD at National institute of Chest and Diseases Hospital in Dhaka city. The study period was 1st January, 2016 to 31st December, 2016. All patients receiving treatment anti tubercular drug at OPD and IPD at National institute of Chest and Diseases Hospital in Dhaka city was the study populations. Non probability purposive sampling technique was done. Inclusion criteria was tuberculosis Patient who are receiving Anti-TB drug for at least 2 week, age more than 17 years and willing participate. Sample size was $n = Z_{\alpha/2} \cdot \sigma / d$ = As per calculation the sample sizes was 245. A Semi-structure questionnaire was developed according to objective and variables. The questionnaire was based on literature review. The questionnaire was divided into three sections, which includes i) socio-demographic characteristics of the respondents ii) questionnaire related to tuberculosis iii) questionnaire related to the measurement of depression severity by the PHQ-9 scale. Assessment criteria of depression by PHQ-9 scale: To measure the level of depression PHQ-9 scale has been used. The PHQ-9 is a new depression diagnostic and severity measure, which is most commonly used version in both clinical and research setting. In this scale nine items are analyzed as a severity measure, the PHQ-9 score ranges from 0 to 27, because each of the 9 items can be scored from 0 (not at all), 1 (several days), 2 (more than half of the days) and 3 (nearly every day). According to this scale the depression severity is categorized as the following way.

PHQ-9 score	Depression severity
1 to 4	None
5 to 9	Mild
10 to 14	Moderate
15 to 19	Moderately Severe
20 to 27	Severe

Data were collected through interview. Then the master tabulation sheet was prepared after proper checking, verifying and editing as per specific objectives and key variables. Analysis of data was finally done with Statistical Package for Social Science (SPSS) software (version 21) of computer on the basis of difference variables. Then the data presentation was perfectly done by MS Word and MS Excel.

III. RESULTS AND DISCUSSION

After completion of the data analysis, the results were organized in the tabular form as necessary respectively. The tables are described as follows:

Results:

Table 1: Demographic distribution of the patients [n=245]

Traits	Characteristics	Frequency	Percentage
Age (in years) Mean Age= 44.6 (±13.86)	≤35	57	23.3
	36-45	70	28.6
	46-55	67	27.3
	>55	51	20.8
Sex	Male	193	78.8
	Female	52	21.2
Religion	Muslim	220	89.8
	Hindu.	25	10.2
Marital status	Married	216	88.2
	Unmarried	29	11.8
Educational qualification	Illiterate	49	20.0
	Up to primary	80	32.7
	Up to secondary	55	22.4
	Up to higher secondary	28	11.4
	Graduation	33	13.5
Occupation	Service	82	33.5
	Business	40	16.3
	Housewives	41	16.7
	Agriculture	32	13.2
	Labor	29	11.9
	Rickshaw puller.	21	8.4
Monthly family income.	Tk ≤ 5000	53	21.6
	Tk 5001-15000	156	63.7
	Tk 15001-25000	24	9.8

	Tk >25000	12	4.9
Number of family member (Minimum 3 and maximum 13)	6-8 person,	147	60.0
	up to 5 persons	67	27.3
	more than 8 person	31	12.7
Person lives in a room.	1	6	2.4
	2	96	39.2
	3	79	32.2
	4	61	24.9
	5	3	1.2

Table 1 shows Demographic distribution of the patients here 70 (28.6 %) of the patients age were 36-45 years, 46-55 years 67 (27.3 %), ≤35 years 57 (23.3%), >55 years 51 (20.8%). male 193 (78.8%) female 52 (21.2%). Muslim 220 (89.8%) and 25 (10.2%) Hindu. Married 216(88.2%) and 29 (11.8%) unmarried. educational qualification up to primary 80 (32.7%) secondary, 49(20.0%) illiterate, 49(20.0%) higher secondary 28 (11.4%). occupation 82 (33.5%) was service, 40 (16.3%) business, 41 (16.7%) housewives and 32(13.2%) agriculture, 29 (11.9%) labor, 21 (8.4%) rickshaw puller. monthly family income 156(63.7%) income 5001-15000 taka, 53 (21.6%) was ≤ 5000 taka, 24 (9.8%) was 15001-25000 taka and 12 (4.9%) was >25000 taka. family member 147 (60.0%) was 6-8 person, 67 (27.3 %) up to 5 person and 31 (12.7%) more than 8 person. minimum 3 person and maximum 13 person. Live in a room, 96 (39.2%) mentioned 2 person, 79 (32.2%) mentioned 3 person, 61 (24.9%) mentioned 4 person, 6 (2.4%) mentioned 1 person. Only 3 (1.2%) mentioned 5 person live in a room in their family.

Table 2: Distribution of the patients history about tuberculosis [n=245].

Traits	Characteristics	Frequency	Percentage
Duration of suffering from tuberculosis	Less than 1 month	26	10.6
	Less than 6 months	75	30.6
	More than 6 months	144	58.8
Site of tuberculosis	Pulmonary	141	57.6
	Extra pulmonary	104	42.4
First treatment place	DOT centre	3	1.2
	Doctors chamber	193	78.8
	Others	49	20.0
Current treatment place	Doctors chamber	3	1.2
	NICDH	242	98.8
Duration of taking treatment	Less than 1 month	189	77.1
	Less than 6 months	55	22.4
	More than 6 months	1	0.4
History of tuberculosis in family members	Present	32	13.1
	Absent	213	86.9
Tuberculosis in family members	Father	6	18.8
	Brother	2	6.3
	Grand father	15	46.9

	Grand mother	9	28.1
Trouble in concentrating on things over the last two weeks	Several days	161	65.7
	More than half the days	37	15.1
	Nearly every day	47	19.2
Very slowly or rapidly movement which is unusual	Several days	171	69.8
	More than half the days	24	9.8
	Nearly every day	50	20.4

Table 2 Shows 75 (30.6%) suffering from tuberculosis for ≤ 6 months, 26 (10.6%) were ≤ 1 month and 144 (58.8%) were >6 months. Pulmonary tuberculosis was 141 (57.6%) and extra pulmonary was 104 (42.4%). Taken first treatment from doctors chamber 193 (78.8%) and 3(1.2%) from DOT center. currently taking treatment 242 (98.8%) from NICDH and 3(1.2%) from doctors chamber. Taking treatment 189(77.1%) ≤ 1 month, 55 (22.4%) ≤ 6 months and 1 (0.4%) >6 months. Suffering from tuberculosis in family members 32 (13.1%) positive history and 213 (86.9%) had not any history. Positive history about suffering from tuberculosis in family members, 15 (46.9%) grandfather and 9 (28.8%), grandmother. 161 (65.7) trouble in concentrating on things over the last two weeks for several days. people 171 (69.8%) noticed about moving or speaking so slowly for several days.

Table 3: Distribution of the patients feelings about tuberculosis [n=245].

Traits	Characteristics	Frequency	Percentage
Feeling shy on illness	Feel shy	94	38.4
	Don't feel shy	151	61.6
Reason of feeling shy for illness	Think that other ignore their family	9	9.6
	Feel inferiority complex	46	48.9
	Think that everybody is avoiding them	17	18.1
	Think that nobody wants to talk to them	22	23.4
Feeling little interest and pleasure in doing things	Not at all	20	8.2
	Several days	167	68.2
	More than half the days	39	15.9
	Nearly every day	19	7.8
Feeling down, depressed, hopeless over the last two weeks	Not at all	73	29.8
	Several days	122	49.8
	More than half the days	26	10.6
	Nearly every day	24	9.8
Trouble falling or staying asleep, or sleeping too much	Several days	76	31.0
	More than half the days	26	10.6
	Nearly every day	143	58.4
Feeling tired or having little energy	Several days	140	57.1
	More than half the days	31	12.7
	Nearly every day	74	30.2
Poor appetite or overeating over the last two weeks	Not at all	5	2.0
	Several days	171	69.8
	More than half the days	4	1.6
	Nearly every day	65	26.5
Bad feeling about yourself or feeling	Not at all	112	45.7

inferiority complex over the last two weeks	Several days	96	39.2
	More than half the days	30	12.2
	Nearly every day	7	2.9

Table 3 shows Feeling shy on illness 94 (38.4%). Reason of feeling shy for illness 46 (48.9%) feel inferiority complex. for several days 167 (68.2%) patients feel little interest and pleasure in doing things. Over the last two weeks 122 (49.8%) Feeling down, depressed and hopeless. Trouble falling or staying asleep, or sleeping too much 76 (31.0%) patients for several days. For several days 140 (57.1%) patients feeling tired or having little energy. over the last two weeks 171 (69.8) % patients feeling poor appetite or overeating for several days. Not at all of bad feeling about yourself or feeling inferiority complex over the last two weeks 112 (45.7%).

Table 4: Distribution of the patients thinking and severity of depression according to PHQ-9 score about tuberculosis [n=245].

Traits	Characteristics	Frequency	Percentage
Thinking of suicide or hurting of yourself over the last two weeks	Not at all	243	99.2
	Several days	2	0.8
	More than half the days	-	-
	Nearly every day	-	-
Difficulty of any problem	Not difficult at all	39	15.9
	Somewhat difficult	147	60.0
	Very difficult	43	17.6
	Extremely difficult	16	6.5
Depression severity	None	-	-
	Mild depression	66	26.9
	Moderate depression	134	54.7
	Moderately severe depression	43	17.6
	Severe depression	2	0.8
Mean PHQ-9 score (SD)	Mild depression =7.58 (1.348)	66	26.9
	Moderate to severely depressed=13.01 (2.43)	179	73.1

Table 4 shows the patients 243 (99.2%) mentioned about thinking of suicide or hurting of yourself for not at all over the last two weeks. Patients 43 (17.6%) mentioned very difficult and 16(6.5%) mentioned extremely difficult of any problem. Here, 134(54.7%) patients suffer from Moderate depression and 43(17.6%) suffer moderately severe depression. According to PHQ-9 score 2 (0.8%) patients were severely depressed, 179 (73.1%) were moderate to severely depressed and 66 (26.9%) patients were in mild depression respectively.

Table 5: Association between depression severities with sex of the patients, Duration of suffering from tuberculosis and Difficulty of any problem [n=245].

Depression severity $\chi^2 = 10.07, df=2, p=.007$	Sex of the patients		Total n (%)	
	Male n (%)	Female n (%)		
Mild depression	61 (92.4)	5 (7.6)	66 (100.0)	
Moderate depression	99 (73.9)	35 (26.1)	134 (100.0)	
Moderately severe to severe depression	33 (73.3)	12 (26.7)	45 (100.0)	
Depression severity $\chi^2 = 8.14, df=4, p=.036$	Duration of suffering from tuberculosis			Total n(%)
	Less than 1 month	Less than 6 months	More than 6 months	
	n(%)	n(%)	n(%)	n(%)
Mild depression	7 (10.6)	18 (27.3)	41 (62.1)	66 (100.0)

Moderate depression	12 (9.0)	37 (27.6)	85 (63.4)	134 (100.0)	
Moderately severe to severe depression	7 (15.6)	20 (44.4)	18 (40.0)	45 (100.0)	
Depression severity $\chi^2 = 54.04, df = 6, p = .000$	Difficulty of any problem				
	Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult	Total
	n (%)	n (%)	n (%)	n (%)	n (%)
Mild depression	24 (36.4)	37 (56.1)	5 (7.6)	-	66 (100.0)
Moderate depression	15 (11.2)	89 (66.4)	22 (16.4)	8 (6.0)	134 (100.0)
Moderately severe to severe depression	-	21 (46.7)	16 (35.6)	8 (17.8)	45 (100.0)

Table 5 shows Association between depression severities with sex of the patients, among 245 respondents 92.4% male and 7.6% female has mild depression, 73.9% male and 26.1% female has moderate depression, 73.3% male and 26.7% female has moderately severe to severe depression. Here, $\chi^2 = 10.07, df = 2, p = .007$. There was highly significant association found in between depression severity and sex of the patients (since p value < .01). Association between depression severities with duration of suffering from tuberculosis of the patients. Mild depression, 10.6% had less than 1 month, 27.3% had Less than 6 months and 62.1% had more than 6 months. Here $\chi^2 = 8.14, df = 4, p = .036$. The result shows that significant association found in between depression severity and duration of suffering from tuberculosis (since p value < .05). Association between depression severities with difficulty of any problem. Here $\chi^2 = 54.04, df = 6, p = .000$. The result shows that, there were highly significant association found in between depression severity and difficulty of any problem that the patients have checked off to do any work, take care of things at home or get along with other people (since p value < .01).

Discussion

This cross sectional study entitled ‘Depression among the Tuberculosis patient’ was conducted in Dhaka city with the objective to assess the level of depression in tuberculosis patients by PHQ-9 Scale and the other factors like the duration of suffering from tuberculosis, the duration of taking anti tuberculin drugs, the socioeconomic status of tuberculosis patients, find out the association between depression severity and socio-demographic characteristics of the patients. To attain these objectives of the study 245 tuberculosis patients were interviewed with a structured questionnaire on the basis of different variables. To measure the depression severity the PHQ-9 scale has been used. The patients were selected purposively maintaining inclusion and exclusion criteria of the study from two study hospitals in Dhaka city. The respondents were interviewed with a structured questionnaire on the basis of different variables of the study.

The study result revealed that among 245 tuberculosis patients the mean age was 44.6 (± 13.86) years, with a range of 18 to 75 years (Table-1). Similar findings were observed in the study of Andhra Pradesh, India by (Bojja V et al. 2010)¹⁵, where the mean age of tuberculosis patients were 42.3 (± 11.54), with minimum 18 years and maximum 73 years. As because tuberculosis is a disease that can affect almost any part of the body but in mainly lung and it has a number of risk factors including age. So the similarity in findings regarding the mean age of the patients of these studies are normal.

The mean monthly family income of the tuberculosis patients was 10040.82 (± 6393.38) taka, with the range of 3000 taka to 30000 taka (Table-1). About number of family member it was found more than half (60.0%) patient’s number of family member was 6-8 person, where 12.7% patient’s number of family member was more than 8 person. Almost one quarter (24.9%) patients mentioned 4 persons live in a room in their house, whereas 2, 3 and 5 persons live in a room mentioned by 39.2%, 32.2% and 1.2% patients respectively. Out of 245 tuberculosis patients, more than half (58.8%) suffering from tuberculosis more than 6 months, whereas 30.6% were suffering for less than 6 months and only 10.6% were suffering for less than 1 month (Table-2). About duration of taking treatment it was found more than three fourth (77.1%) were taking treatment of

tuberculosis for less than 1 month, 22.4% and 0.4% were taking treatment of tuberculosis for less than 6 months and more than 6 months respectively (Table-2). In the study of (Rahul M et al.2015)¹⁶, the scenario of taking anti tuberculin drug of tuberculosis patients was <3months (19.7%), 3-6 months (23.8%) and >7months (7.4%).

It was found that 78.8% (Table-2) had taken first treatment from doctor's chamber and as the data were collected from National Institute of Chest Diseases & Hospital (NICDH) 98.8% all most all respondents (Table-2) were taking treatment currently from that hospital. In present study about the site of tuberculosis it was found that pulmonary tuberculosis was in more than half (57.6%) patients and extra pulmonary tuberculosis was in 42.4% patients (Table-2). Higher percentages in pulmonary tuberculosis patients 70.5% and 69.3% were showed in the study conducted by (Basu G et al.2012)¹⁷ and (Rahul M et al.2015)¹⁶ respectively. This dissimilarity may be due to living condition, working environment or personal habits of the respondents. More than one third (38.4%) patients feel shy on their illness and about the reason they mentioned inferiority complex 48.9%, think that nobody wants to talk to them 23.4%, everybody is avoiding them 18.1% and ignore their family 9.6% (Table-2).

Highly significant association found in present study in between depression severity and sex of the patients (p value .007) (Table-5), but in the study by (Santosh K.2016)¹⁸ mentioned that there is no significant difference depression of T.B patient's. This differences may be due to geographical and socio demographic variation of the respondents. Depression severity was not associated with educational qualification =p value and 138 and site of tuberculosis of the patients =p value .108.

Tuberculosis (TB) is a chronic disease of the utmost public health concern worldwide. It is a serious public health problem in Bangladesh. Bangladesh ranks 6th globally in terms of the burden of TB on the population. Depression is a common co-morbid condition for patients with tuberculosis and is associated with higher morbidity and mortality, antibiotic drug resistance and community transmission. Psychiatric conditions like depression and anxiety are high among tuberculosis patients, major reason being misconception about tuberculosis. Most of the patients consider that TB as a dangerous disease that had less chances of survival and cure that resulted in discontinuation of treatment. The lengthy process of treatment, disturbances in their life routine and its chronicity of tuberculosis is important factor for depression. During the study various types of limitations were faced which may influence the external and internal validity of the study. The study was conducted in a selected hospital in Dhaka city. So the results may not coincide with large-scale survey. That's why it may not represent the overall population, hence may not sufficient for generalization. As because the study respondents were patients suffering from tuberculosis, so it was very difficult to collect data from them. Due to their illness and as well as depression they offered less concentration and time.

IV. CONCLUSION & RECOMMENDATION

Depression is commonly co-morbid with chronic physical illnesses and is associated with a range of adverse clinical outcomes. In tuberculosis depression is a silent driver. The degree of depression was related to various factors like age, sex, socioeconomic status, duration of suffering from the disease and so on. It leads to hopelessness and decreased resistance to infections, so it adversely affects the patient's compliance to TB treatment. It is important to diagnose and treat depression in time to get the desired results of TB treatment all over the world and especially in developing countries like Bangladesh. The need to build capacity on recognition and management of depression is highly important, so that more comprehensive care can be provided. It is necessary to raise awareness and education about Tuberculosis through increasing coverage of mass media as well as all health centers that are provided Tuberculosis related treatment.

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