

Prevalence and Determinants of Depression among Patients with Tuberculosis in Municipal Corporation of Sagar District in the State of Madhya Pradesh, India

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Abstract

Introduction: Tuberculosis remains one of the most important causes of mortality across world with 1.3 million deaths annually. India accounts for one-fourth of the global Tuberculosis (TB) burden. Aim of the study was to find out the prevalence and determinants of depression among Tuberculosis patients and association between depression and the socio-demographic characteristics of the TB patients.

Methodology: A cross sectional study was conducted in all 7 DOTS centers in Sagar Municipal Corporation of Sagar district, Madhya Pradesh, India. Convenient sampling technique was used for selecting 103 TB patients who undergone treatment in these DOTS centres during the period of March to May 2018. Data analysis was done by using SPSS version-17, with statistical significance at p-value of 0.05.

Results: Among 103 TB patients the prevalence rate of depression was nearly one third (64%). The age group of 38-57 years had 3.3 times more odds of developing depression compared to age group 18-37 years ($p=0.037$). The unemployed group had 3.7 times more odds of developing depression compared to employed group ($p=0.007$).

Conclusion: It concludes that the prevalence rate of depression among TB patients was high. The frequency of moderate/severe depression was found to be less among males than females. There was an association between depression and socio demographic determinants such as age, employment type of family etc. It emphasizes the need for providing a proper diagnosis and treatment for depression along with the TB drugs for improving the compliance of the TB program.

Keywords: Tuberculosis, depression, incidence, prevalence.

Introduction

Tuberculosis is a leading cause of morbidity and mortality, especially in low-income and middle income

countries. Tuberculosis (TB) is an infectious bacterial disease caused by Mycobacterium tuberculosis which affect the lungs and can also damage other organs of the body. As per the Global TB report 2017 the estimated incidence of TB in India was approximately 28,00,000 accounting for about a quarter of the world's TB cases.^[1] Tuberculosis kills more than 1 million people every year, most of them in low-income and middle-income countries.^[2,3,4] An understanding of the trends in tuberculosis incidence, prevalence and mortality is crucial to track the success of tuberculosis control programmes and to identify remaining intervention challenges for tuberculosis care and prevention.

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People living with tuberculosis are often suffer from depression.^[5,6] Depression weakens the psychosocial welfare and results in negative treatment outcomes among TB patients.^[7,8] It can also negatively affects health-related quality of life of TB of patients.^[9] In addition, TB patients with depressive symptoms have reduce social contact and ignore social responsibilities especially at the stage of coughing that leads to low self-esteem and hopelessness.^[10]

There are certain factors are associated with the occurrence of depression among TB patients. Human Immune deficiency Virus (HIV) infection, poor social support and perceived stigma have a higher risk of developing depression among TB patients.^[11-13] Other risk factors like side effects of the drugs and the financial constraints, Older age, female sex, duration of illness, level of education were also identified.^[14,15] Depression is a condition that adversely affects patients' ability to cope with stress the side effects of treatment and everyday life. Many studies also found that depression had negative effect on treatment adherence, a very important aspect in TB control.^[16] Therefore, it is essential to study the prevalence and determinants of depression among TB patients.

Methodology

Selection of the DOTS centers

All the 7 DOTS centers in Sagar Municipal Corporation of Sagar district were selected for the research study under the supervision of RNTCP program in Sagar Municipal Corporation facilitated by NGO "Bharti Jan Kaliyan Samitee Sagar Madhya Pradesh".

Study Design: A cross sectional study was conducted in all 7 DOTS centers in Sagar Municipal Corporation of Sagar district, Madhya Pradesh, India. Convenient sampling technique was used for selecting 103 TB patients who undergone treatment in these DOTS centres during the period of March to May 2018.

Selection of the Respondents: Convenient sampling technique was applied for selecting 103 respondents from 7 DOTS centers in Sagar Municipal Corporation. In order to take care of non-response due to various reasons, an extra 10% of respondents were included in the sample. i.e. 114 TB patients were selected for the interview. Totally, 103 TB patients were completed the interview and 8 TB patients declined to

participate interview. The response rate of the research study was 84%.

Tools: The TB patients were assessed using a structured questionnaire which was pretested. PHQ-9 Depression Scale - The Patient Health Questionnaire (PHQ) is based on DSM-IV criteria, its disorders divided into threshold disorders according to DSM-IV and subthreshold conditions. It has been developed as a fully self-administered version of the original PRIME-MD by Spitzer et al.^[17]

Pilot testing of the tool: The tool was pilot tested on 10 patients from Rahatghad DOTS centre Sagar MP. The pilot testing was done to practically use the tool and to understand the feasibility of the study. The individuals participated in the pilot testing were not involved in the main study.

Data Analysis: Data analysis was carried out by using Statistical Package for Social Sciences version 20. Categorical variables were presented as frequencies and percentages. The association between the variables was analyzed by chi-square and regression analysis.

Limitation of the study: The study was restricted to a small city so the result is valid only for the specific area and situation. Limited resources were the major constraint in research as it was self-financed study.

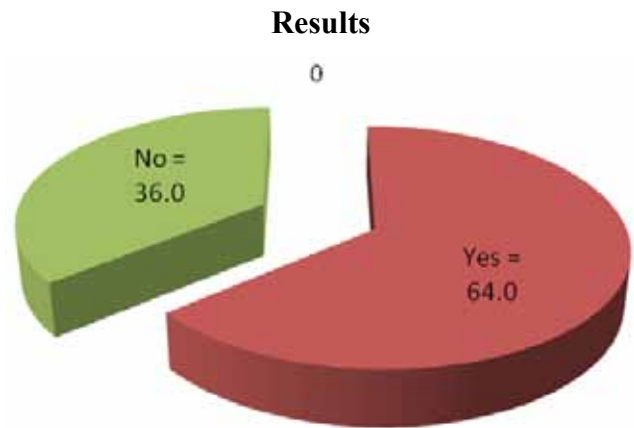


Figure 1. Percentage Distribution of Depression among TB patients (N= 103)

A total of 103 TB patients were involved in the research study, [Figure 1] indicates that percentage distribution of depression among TB patients, a total of 66 (64%) of the TB patients were found to be depressed while 37 (36%) were not depressed.

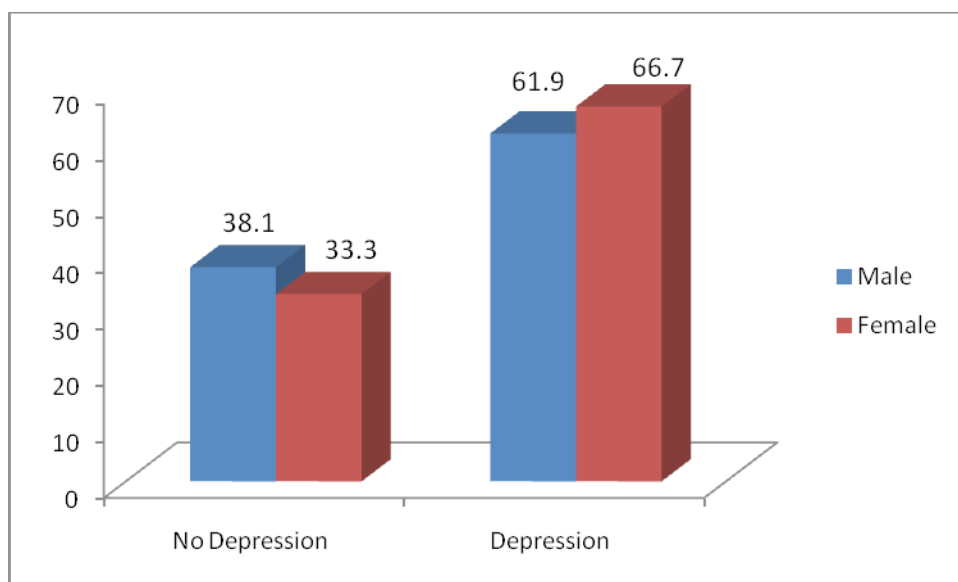


Figure 2. Prevalence of depression among TB patients according to sex

According to [Figure 2], depression in TB patients regarding sex, among 55 male TB patients, 34 (61.9) were found to be depressed while among 48 female TB patients, 32 (66.7) were found to be depressed.

Magnitude of depression of TB patients: The present study shows that the level of depression among TB patients according to socio demographic characteristics. Depression in TB patients regarding age, 24 (72.7%) of TB patients had moderate depression in the age group of 38-57 years followed by 7 (70%) in the age group of 58 and above whereas 30 (50%) of TB patients had no depression in the age group of 18-37 years. Result reveals that out of 55 male patients, 31 (56.4%) of male had moderate depression and 3 (5.5%) had severe depression same time 29 (60.4%) of female had moderate depression. The result indicates that

among Muslim category, 8 (72.7%) of TB patients had moderate depression whereas among Hindu category it was 52 (57.1%). The prevalence of moderate depression was high among married patients 53 (65.4%) whereas 14 (63.6%) of unmarried TB patients had no depression. Two third of the 60 (60.6%) TB patients had moderate depression who belong to joint family whereas 3 (75%) of TB patients had no depression who belong to nuclear family. It can notice, prevalence of moderate depression was higher among unemployed 42 (66.7%) TB patients whereas it was 18 (45%) among employed category. It is quite interesting that, there was none among TB patients had severe depression who had completed UG and PG education. But 8 (72.7%) of TB patients who completed UG degree had moderate depression followed by primary educated patients 39 (68.4%).

Table 1: Level of degree of Depression of TB patients

Characteristics		Level of degree of depression (N = 103)		
		No Depression	Mild/moderate Depression	Severe Depression
Age	18-37	30(50)	29(48)	1(2)
	38-57	6(18)	24(73)	3(9)
	58 & above	1(10)	7(70)	2(20)
Sex	Male	21(38)	31(56)	3(5)
	Female	16(33)	29(60)	3(6)

Characteristics		Level of degree of depression (N = 103)		
		No Depression	Mild/moderate Depression	Severe Depression
Religion	Hindu	34(37)	52(57)	5(5)
	Muslim	3(27)	8(73)	0(0)
	Other	0(0)	0 (0)	1(100)
Marital status	Married	23(28)	53(65)	5(6)
	Unmarried	14(64)	7(32)	1(5)
Family type	Joint	34(34)	60(61)	5(5)
	Nuclear	3(75)	0(0)	1(25)
Employment status	Employed	22(55)	18(45)	0(0)
	Unemployed	15(24)	42(67)	6(10)
Educational qualification	Illiterate	4(44)	4(44)	1(11)
	Primary	18(30)	39(65)	3(5)
	Secondary	12(52)	9(39)	2(9)
	UG	3(30)	7(70)	0(0)
	PG	0	1(100)	0(0)
Addiction	No addiction	29(35)	50(60)	4(5)
	Addiction	8(40)	10(50)	2(10)

[Table 1] shows that the level of degree of Depression of TB patients in the study areas. The level of depression was rising while increasing the age. TB patients whose age was 57 & above had severe depression (20%) while half of the TB patients had no depression among 18- 37 age group. Both male and female had similar proportion of severe depression 5% and 6% respectively. Around three fourth of the (73%) TB patients belongs to Muslim category had mild/moderate depression than Hindu community (57%). Around three third of the TB patients (65%) who married had mild/moderate depression while this proportionate was very less among who had not married (32%). It was quite interesting that majority of the TB patients (75%) had no depression that belongs to nuclear family whereas 61% of TB patients had mild/

moderate depression that belongs to joint family. Result shows that two third of the TB patients (67%) who were unemployed had mild/moderate depression than employed patients (45%). Majority of the TB patients (70%) who were highly educated (UG & PG) had mild/moderate depression than illiterate patients (44%) and also 44% of the TB patients who were illiterate had no depression about their disease. Study result [Table 1] reveals that three third of the TB patients (60%) had mild/moderate depression were not addicted to any kind of substance abuse than those who were addicted (50%) and 10% of TB patients had severe depression were using substance abuse and also TB patients who were not addict and addict any substance abuse had no depression 35% and 40% respectively.

Table 2: Logistic regression analysis of factors associated with depression among TB patients

Determinants	Unadjusted regression (n=103)		Adjusted regression (n=103)	
	Odds ratio	p-value	Odds ratio	p-value
Age				
18-37 years	1	.004	1	.069
38-57 years	4.500	.004	3.351	.037
58 & above	9.000	.043	4.060	.213

Determinants	Unadjusted regression (n=103)		Adjusted regression (n=103)	
	Odds ratio	p-value	Odds ratio	p-value
Sex				
Male	1		-	-
Female	1.235	.609	-	-
Religion				
Hindu	1	.808	-	-
Muslim	1.591	.514	-	-
Marital Status				
Married	1	-	1	-
Unmarried	.227	.003	.355	.073
Family Type				
Joint	1	-	-	-
Nuclear	.174	.137	-	-
Employment Status				
Employed	1		1	-
Unemployed	3.911	.002	3.716	.007
Education				
Illiterate	1	.425	-	-
Primary	1.867	.391	-	-
Secondary	.733	.695	-	-
UG	1.867	.517	-	-

Result [Table 2] shows that there was an association between the age group of TB patients with respect to the level of depression about TB diseases. The difference in proportions of depression of TB patients for male and female was statistically significant as p-value is .609. Marital status of TB patients indicates that difference in proportions of depression for married and unmarried was statistically significant as p-value was .003. The prevalence of depression in different employment status has association with statistically significant as p-value is .002. All other responses and results in table.2 are not statistically significant as p-values are more than 0.05.

Discussion

In the present research study, objective was to assess the frequency and degree of depression of TB patients in all the 7 DOTS centers in the Sagar municipal cooperation, Sagar district, Madhya Pradesh. A limited study has been conducted to assess the prevalence of depression of TB patients globally. The present research study shows that 64% of TB patients had either moderate

or severe depression. The finding was comparable with other studies carried out in southern Ethiopia such as 43.4% in Wolayta zone,^[18] and 54% Gurage and Silte zone.^[19] It is also similar with other studies conducted sub-Saharan Africa 49.4% in Angola^[20] and 61.1% findings of the Southwest Region of Cameroon.^[21] The prevalence of depression among TB patients in this study is slightly higher than other similar studies elsewhere like 35% in India,^[22] This is similar to a study in Lima, capital city of Peru, in which depression was highly prevalent among newly diagnosed TB patients.^[23] Another study indicated that being on retreatment for TB (OR= 11.2, 95% CI: 5.2–31.1, $P<0.001$) and having discontinued treatment (OR=8.2, 95% CI: 1.1–23.3, $P<0.05$) were factors associated with having a higher chance of being depressed.^[24]

The degree of depression ranges from moderate form that may not need any kind of medical treatment but if it is severe depression that may require necessary assessment and appropriate treatment and management.

In this present study, almost two third of the TB patients were presented with mild/moderate depression. Diagnosing the severity may be important because individuals with advanced forms of depressions may be less likely to adhere to anti-TB drugs which increased risk of drug-resistance,^[25,26] poorer quality of life and greater disability,^[25] lack of adherence to anti-TB treatment and Poor treatment outcomes including death. The presence of depression in TB patients leads to poor compliance with anti-TB treatment and hence, poor prognosis, thus increasing the morbidity and mortality due to TB.^[27] The prevalence of depression among tuberculosis patients was 51.9% (95%CI=42.7, 62.2%) with 34.2% were mild cases. In our logistic regression analysis, odds of developing depression among tuberculosis patients with age less than 25 years were 0.5(50% protective effect) [AOR=0.5, 95% CI 0.26–0.99] where as patients with a monthly income within the 25th percentile were four times higher odds to have depression [AOR=3.98, 95% CI: 2.15–7.39]. It shows that newly diagnosed patients for TB were associated with depression (OR=0.39 (0.21–0.74)).^[28]

Tuberculosis patients are challenged by mental health problems too. It is difficult to them to lead socially and economically productive life with the health status currently they have due to social isolation^[29], depression and an enormous economic burden.^[30] Hence, programs designed to reduce/eradicate tuberculosis in local level, national or international level should be screened and managed depression in addition to economically and socially support. People admitted to health care institutions due to TB or its complication, it's better to screen whether the person undergoing to depression or not, if yes, treat it. This may improve or enhance treatment outcome and engage in recreation a positive role in effort to reduce and eliminate tuberculosis from the community. According to HADS and PHQ-9, 17.73 and 18.13% of 1252 PTB patients, respectively, had significant depressive symptoms and based on HADS scale, 18.37% had significant anxiety symptoms. Approximately 70% of patients with probable depression also had significant anxiety symptoms and vice versa and 69.6% patients with anxiety symptoms were also diagnosed with probable depression in our study population. Dyspnea and TB were significantly associated with depressive symptoms. Other depressive symptoms-related factors included age, divorce, abnormal body mass index (BMI) and low income.^[31]

Age was one of the major risk factors for depression

in the present study. As similar to another Ethiopian study,^[32] age less than 35 years was protective for depression among TB patients. This may be at younger age people may engage in different activities to earn money which may increase social interaction and most probably get support from colleagues or relatives. At older age, life in poor countries may be challenging as the habit of saving was low, engagement to economical activities may be stressful beside the challenges of tuberculosis like stigma, discrimination, anti-Tb side effects.^[33] These stressful life events and severity of tuberculosis were associated with depression in studies conducted in Nigeria and Ethiopia.^[32, 34] During the present study, it was noticed that they had fear of losing their life, decreased hours of sleep and quantity of food and also decreased interest in communication with people due to complications of the disease. Once they undergone the diagnosis and treatment is started, TB patients experience relaxed and show sense of relief, however, they may soon become anxious, irritable and depressed due to nature of disease and its complications and prognosis. Level of education and emotional maturity were important factors for proper adaptation to treatment. Young TB patients tend to comply less well with drug treatment than older patients. Young TB patients are irregular in taking medicines. They are more argumentative and aggressive than the old patients.

Adult patients are more prone for the depression as they are very much concerned for their job loss, burden of expenses in the treatment, reversal of role in their family from bread earner to dependent one. It is also possible that patients with TB are perceived as a source of contagion in the community, which may lead to discrimination, stigma, social isolation and rejection and may predispose individuals to a higher risk for depression.^[35,36] TB patients are totally dependent on their family, they feel neglected and isolated. Other medical conditions such as diabetes and hypertension aggravate the condition. Due to poor social support, these patients are more susceptible for the psychiatric complications.^[37] The process of diagnosis was made and medicine was started, patients felt relaxed and get relief but very shortly they become depressed due to upset about the nature of TB and its consequences, seriousness and prognosis. Most of them had panic of death as a result of it their sleeping hours was substantially reduced and also less appetite. More over their interaction with public especially family members was less because of the nature of disease. Young TB patients were more

victim for the depression because they were much more worried for their job failure, expense of treatment, burden of family and also their society.

Conclusion

The prevalence of depression was high among females than the male TB patients. The degree of depression was related to various determinants like age, sex, religion, type of family, marital status, education status and employment status. Due to physical weakness associated with disease, TB patients are not able to go for jobs regularly which put into more depression financially. A smaller amount of social and family support gives patients feeling of being mistreated, isolated and valueless. The aim of this study was to assess the depression and determinants of TB patients in Sagar Municipal Corporation of Sagar District, Madhya Pradesh State. By keeping this aim is the hope that such understanding will lead to developing ways of helping the TB patients to accomplish a most favorable adjustment. Young patients are more prone for the depression as they are very much concerned for their job loss, over expenses in the treatment, reversal of role in their family from independent to dependent one. With increasing number of patients suffering from TB disease, it is necessary to raise the level of screening, early diagnosis and treatment of depression of TB patients. Screening and diagnosis will help both the treating physician and the TB patient for further treatment and also emphasizes the need for providing proper diagnosis and treatment for reducing the depression of TB patients and also for their improving the quality of life.

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Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: The research study entitled “Prevalence and Determinants of Depression among patients with tuberculosis in Sagar Municipal Corporation, Sagar District, Madhya Pradesh, India” was approved by the Ethics Committee of Indian Institute of Public Health Gandhinagar, Gujarat and

has given permission for data collection from National Health Mission Madhya Pradesh.

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