

## Article

# Depression comorbidity among patients with tuberculosis in a university teaching hospital outpatient clinic in Nigeria

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## ABSTRACT

**Background** Tuberculosis (TB) remains a leading infectious cause of morbidity and mortality throughout the world. Medication non-compliance has been recognised as one of the drawbacks in the successful management of this disease. Hence, different approaches for ensuring medication compliance have been adopted; these include the Directly Observed Therapy Short course (DOTS). TB is associated with psychiatric morbidity, particularly depressive disorder, and this has been recognised as a cause of poor compliance and a cause of increased morbidity and mortality from the disease. Despite this recognition, little attention is paid to the identification of depression among TB patients, particularly in the DOTS clinics that most of these patients attend. This study was designed to determine the prevalence of depression in patients with TB attending the DOTS outpatient clinic in a university teaching hospital in Nigeria, and to find out the factors that may be associated with this.

**Method** All consenting TB patients attending the clinic completed a socio-demographic questionnaire and nine-item Patient Health Question-

naire (PHQ-9) designed to screen for depression, especially in outpatient and primary care settings.

**Results** Sixty-five patients participated in the study of whom 41 (63.1%) were males. The mean age of the respondents was  $35.1 \pm 14.4$  (range 15-70 years). Eighteen (27.7%) of the patients had depression, comprising 14 (21.5%) with mild depression and four (6.2%) with moderate depression. Socio-demographic factors (age groups,  $P=0.024$ ; and financial status,  $P=0.02$ ) and a clinical factor (persistent cough,  $P=0.04$ ) were significantly associated with depression.

**Conclusion** Measures to reduce depression among patients with TB should include effective symptom control, particularly of coughing, and measures to improve the financial status of this group of patients. Financial empowerment of patients may reduce depression in them, improve the compliance rate to anti-TB medication, and could furthermore bring an improvement to their quality of life.

**Keywords:** depression, outpatient clinic, TB

## Introduction

Tuberculosis (TB) is a serious public health problem in Nigeria with an estimated prevalence of nearly 900 000 cases. Nigeria has the second highest TB

disease burden in Africa and ranks fifth among the 22 highest TB burden countries in the world.<sup>1</sup> With the growing interest in psychiatric comorbidity in

medical and surgical patients, the consequences of TB have been understood better than previously.<sup>2</sup> Studies have shown that the prevalence of depression and other psychiatric disorders is high among patients with TB.<sup>3,4</sup> Other types of psychiatric disorders reported include generalised anxiety disorder, adjustment disorder and organic brain disorders.<sup>4</sup> A retrospective cohort analysis of 440 TB patients has revealed a high rate of relapse due to poor medication compliance, and psychiatric disorders, alcoholism and drug addiction have been implicated.<sup>5</sup> Therefore, it may be important to assume that to increase treatment compliance and reduce relapse of TB, prevention and prompt treatment of psychological disorders in patients with TB may be helpful. The problem of stigmatisation is frequently associated with both psychiatric illness and TB in Nigeria, and the possibility of being diagnosed as a TB and a psychiatric patient could impose a psychological burden on patients. It is possible that this trauma may precipitate or predispose patients suffering from TB to suffer a psychiatric disorder.<sup>6</sup>

Directly observed treatment (DOT) or the short treatment course DOTS are forms of management in which patients' use of anti-TB drugs is supervised by a health worker in an outpatient or primary health-care setting. It was introduced by the World Health Organization (WHO) in 1995 and has come to be regarded by the WHO and major international TB agencies as the best way to control and cure TB. The range of measures in DOTS include: (i) placing the patient at the centre of activities for the control of TB; (ii) ensuring confidentiality and consideration of patients' needs; (iii) organising TB services so that the patient has treatment as close to home as possible; (iv) considering incentives; (v) identifying potential problems; (vi) keeping accurate address records and (vii) taking measures to deal with defaulters.<sup>5,7</sup>

The objective of the study was to assess the prevalence of depression comorbidity and to find out factors that may be associated with this.

## Methods

This study was conducted over six months between July and December 2008 in a newly established DOT clinic at the general outpatient section of the Department of Family Medicine, University of Ilorin Teaching Hospital (UITH), Ilorin, Kwara State, Nigeria. UITH has a primary healthcare centre with two comprehensive health centres located at Esie (about 70 km away from Ilorin, the location of the main hospital) and Ihima (located in a nearby Kogi state). These centres are headed by general practitioners assisted by community health officers (CHOs), nurses

and community health extension workers (CHEWs). In addition to these centres UITH also has a department of family medicine with five consultant family physicians or trained general practitioners and 15 resident physician trainees undergoing training supervised by the Faculty of Family Medicine of the National Postgraduate Medical College and the West African Postgraduate Medical College.

The study was carried out in the DOTS clinic. Participants completed a clinical evaluation and the Patient Health Questionnaire (PHQ-9). The clinic's patients are drawn from Ilorin and the surrounding towns and villages in the state, either by referral from the catchment cottage hospitals, private clinics, self-referral, or following detection by other physicians within the section during routine general medical examinations. There is good collaboration between family physicians and other specialists within the hospital in terms of prompt referrals and feedback on the referred cases from the specialists.

We distributed a self-administered questionnaire that detailed the socio-demographic and some clinical aspects of TB to the consenting consecutive patients attending the DOT clinic. In addition, the patients responded to a nine-item Patient Health Questionnaire (PHQ-9) which was chosen as the screening instrument for depression because of its brevity, ease of scoring and because of its good psychometric properties when compared to other validated instruments.<sup>8</sup> It is specifically designed for use in primary care and outpatient settings and has been widely used in both clinical practice and research.<sup>9</sup> It is a nine-item self-report questionnaire that asks participants to rate how they have felt during the previous two weeks. Each question was scored 0 to 3 (0 = not at all, 1=several days, 2=more than half the days, and 3=nearly every day) with a result range of 0–27. The nine items reflects the DSM-IV criteria for major depressive disorder. The interpretation of the scores rates the severity of depression. A score of 0–4 indicates no depression; 5–9 mild depression; 10–14 moderate depression; 15–19 moderately severe depression; and 20–27 severe depression.

The PHQ-9 was administered in English and those participants who were not comfortable with the English language completed the Yoruba version. The number of participants who chose to complete the Yoruba version was 15 (23%).

The study protocol was approved by the hospital research and ethic committee.

## Statistical analysis

The Statistical Package for the Social Sciences (SPSS) 11 program was used for statistical analysis. Results were calculated as frequencies (%), means and

standard deviations. The Chi-square test was used to calculate the differences between groups at a 5% level of significance.

## Results

Sixty-five patients participated in the study of whom 41 (63.1%) were males. The mean age of the respondents was  $35.1 \pm 14.4$  (range 15–70 years), and the mean weight was  $55.2 \pm 8.5$  (range 34–81 kg). Thirty-nine (60%) participants were married and 26 (40%) were single. Fifty-two (81.3%) were urban dwellers while 12 (18.5%) lived in the rural area. The mean income was 14 666.6 naira.

Table 1 shows that 47 (72.3%) of the patients were euthymic and 18 (27.7%) screened positive for depression. Fourteen (21.5%) screened positive for mild depression and four (6.2%) screened positive for moderate depression.

Twelve (29.3%) of the males were depressed compared with six (25.0%) of the females (see Table 2). The gender of the respondents was not statistically related to a positive depression screening according to PHQ-9. Only three (16.7%) of the depressed patients were single while 15 (83.3%) were married. The respondents' marital status was not significantly related to depression. There was a significant association between the age group of the patients and depression ( $P=0.024$ ) with those aged 35 years and over more likely to have depression than those below 35 years of age.

A commonly used measure of improvement in patients with TB is weight gain. Fifty-five (84.6%) of our cohort subjectively reported weight gain. Of these, 13 (23.6%) had depression compared with four (50%) of the eight patients that did not report weight gain. The relationship between weight gain and depression was, however, not significant. Patients' reports of the presence of side effects of anti-TB drugs

were not related to depression morbidity, nor was their place of residence. Presence of a persistent cough at the time of the study was significantly related to depression ( $P=0.04$ ), and of the 26 patients who were still coughing, ten (38.5%) had depression.

One factor that DSM-IV uses in accessing the impact of mental disorder on the sufferer is the degree of socio-occupational dysfunction the disorder produces. Of the 17 patients that rated their socio-occupational function as either 'somewhat difficult' or 'very difficult', 13 (76.5%) were depressed ( $P=0.000$ ; see Table 3). Forty-five (69.2%) of the patients were earning below the Nigerian national minimum wage that was at the time of study 7500.00 naira (about US\$62.5). Ten (22.2%) of these patients had depression compared with eight (40%) patients that were earning above the national minimum wage ( $P=0.02$ ).

## Discussion

This study from UITH in Nigeria attempts to look at the relationship between mood disorder and TB. Although the sample size is small it still allows some inferences to be drawn about this population because of the homogeneous nature of the sample population, and because both the sample size and the study design are similar to other published studies of depression or psychiatric morbidity among TB patients within and outside Nigeria.<sup>4,7</sup> The 27.7% prevalence of depression in this study sample is lower than the 49% found by Natani and colleagues<sup>7</sup> in India but higher than the 11.3% found by Aghanwa and colleague in Nigeria.<sup>4</sup> These different prevalence rates might possibly be due to the differences in the sensitivity of the screening instruments used and the patient cohort studied. Natani *et al*'s patients were inpatients whilst Aghanwa and colleague screened patients were attending an outpatient chest

**Table 1** PHQ-9 severity of depression

Diagnosis	Number of respondents (%)	Mean PHQ-9 score ( $\pm$ sd)	Range
Not depressed	47 (72.3)	1.26 (1.5)	0–4
Mild depression	14 (21.5)	6.4 (1.3)	5–9
Moderate depression	4 (6.2)	11.5 (1.3)	10–13

The mean PHQ-9 score of all the respondents =  $3.0 \pm 3.4$  (range 0–13)

**Table 2** Severity of depression and some clinical and socio-demographic variables

Variable	Severity of depression			P-value
	None	Mild	Moderate	
<b>Gender</b>				
Male	29	11	1	0.137
Female	18	3	3	
<b>Age group of patients</b>				
15-34	33	3	2	0.024
35-54	10	8	1	
55-75	4	3	1	
<b>Marital status</b>				
Single	20	3	0	0.076
Married	24	11	4	
<b>Weight gain since commencement of treatment</b>				
Yes	42	9	4	0.079
No	4	4	0	
<b>Report of side effects of drugs</b>				
Yes	9	5	1	0.432
No	38	9	3	
<b>Place of residence</b>				
Urban	36	12	4	0.503
Rural	10	2	0	
<b>Patient still coughing</b>				
Yes	16	6	4	0.04
No	29	7	0	
<b>Financial status</b>				
>Minimum wage	12	8	0	0.02
<Minimum wage	35	6	4	

**Table 3** PHQ-9 rating and socio-occupational dysfunction

Diagnosis	Not at all difficult	Somewhat difficult	Very difficult
Mild	4	8	1
Moderate	0	3	1
None	43	4	0
Total	47	15	2

P=0.0000

clinic, which may be similar to the setting used in this study. The high depression prevalence rate in Natani *et al's* study may be related to other confounding psychological factors associated with hos-

pital admission, which may include severity and presence of complications of TB, being cared for in an inpatient setting and the financial burden associated with hospital admission.

A similar prevalence of depression to that found in this study is seen in other chronic and life-threatening conditions such as end-stage renal disease.<sup>10</sup> The threat to life, coupled with adverse social consequences, may be important aetiological factors.<sup>4</sup>

This study was in agreement with the findings of other studies<sup>4,10,11</sup> that report a higher prevalence of depression among older age groups. This increased prevalence may be due to the increased responsibilities borne by an older age group who, despite being afflicted with TB, still had to cope with other responsibilities such as child care and care of other family members, as well as employment related responsibilities.

This study did not find any relationship between gender, marital status, weight gain, side effects and place of residence and depression. The associations between financial status of the patient and persistent cough with an increased rate of depression reinforces earlier findings that implicated low socio-economic status as a risk factor for depression in TB.<sup>4,11,12</sup> Although treatment of TB is free in Nigeria, the burden of poverty and its psychological effects, coupled with the stigma of a diagnosis of TB and its physical impact is likely to compound the stress, leading to further decompensation of coping mechanisms.

Cough is probably one of the most prominent and burdensome disease-related symptoms in pulmonary TB and its persistence might be perceived by the patient and care giver as evidence of worsening illness or ineffective treatment, so increasing the patient's worry. Coughing has a profound effect on the overall quality of life of the patient<sup>13</sup> because of its potential to compromise work, school, sleep and social interactions. These factors may account for why cough could be associated with depression in patients with TB. A higher index of suspicion for depression should be applied by primary care doctors and community workers when assessing those patients with the symptom of persistent cough in TB, as they may benefit from treatment of depression in addition to that of their TB.

## Conclusion

In conclusion, the prevalence of depression (27%) among patients with TB in the Ilorin DOTS clinic is high and associated with older age group, poor financial status and persistent cough. Primary care doctors and other primary care clinicians need to develop systematic strategies to a) identify and b) reduce the prevalence and symptoms of depression in this group. Persistent cough may be an additional marker of

those patients who are more likely to be depressed. Better management of comorbid depression could improve compliance rates with anti-TB medication and improve quality of life but larger population studies are necessary to identify the optimal way of managing the treatment of depression in this patient group.

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#### CONFLICTS OF INTEREST

None.

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