

Prevalence and Associated Risks Factors of Psychological Distress among Tuberculosis Patients Receiving Treatment in the Buea and Limbe Regional Hospitals

Nkweleko Falone Fankam^{1,*}, Akum Eric Achidi^{1,2}, Tah Aldof Yoah^{1,4},
Eric Berand Fokam^{1,3}, Fai Bafon Theophile¹

¹Epidemiology and Control of Infectious Diseases, Department of Microbiology and Parasitology, University of Buea, Buea 63, Cameroon

²Department of Biochemistry and Molecular Biology, University of Buea, Buea 63, Cameroon

³Department of Zoology and Animal Production, University of Buea, Buea 63, Cameroon

⁴Department of Public Health and Hygiene, University of Buea, Buea 63, Cameroon

*Corresponding author: fankam93@yahoo.com

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Abstract Introduction: Tuberculosis (TB) remains a leading cause of morbidity and mortality worldwide. Mood disorders seem to be particularly common in TB patients. Psychological distress has been shown to reduce adherence to drugs thus negatively impacting prognosis. **Objective:** The present study was designed to determine the prevalence and associated risk factors of psychological distress among tuberculosis patients in the Buea and Limbe TB treatment centers. **Methodology:** A cross sectional hospital-based study was carried out to achieve the objective. A structured questionnaire was administered to 300 TB patients to collect socio-demographic data. The Kessler psychological distress scale (k-10) was employed to ascertain the presence or absence of psychological distress. Data was analyzed using stata 13 and Nvivo 10. Multivariable logistic regression was used to identify risk factors. Statistical significance was set at $p < 0.05$. **Results:** The overall prevalence of psychological distress was 43.3% (95%CI: 40.7 - 49.4). The prevalence of mild, moderate and severe psychological distress were 35.3%, 7.0% and 1.0% respectively. Being HIV positive (AOR = 6.10, 95% CI: 2.64 - 14.01), having a low socioeconomic status (AOR = 2.50, 95% CI: 1.04 - 4.12), not receiving support from family members (AOR= 2.65; 95% CI: 1.60 - 4.32) and family history of psychological distress (AOR= 2.3; 95% CI: 1.01 - 4.02) significantly increased the odds of being psychologically distressed. **Conclusion:** The study found high rates of psychological distress among tuberculosis patients. Improved training of providers in screening for psychological distress, appropriate referral to relevant health practitioners and providing comprehensive treatment for patients with TB who are co-infected with HIV is essential to improve their health outcomes.

Keywords: prevalence, risks factors, psychological distress, tuberculosis patients, Buea and Limbe Regional Hospitals

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1. Background

In Cameroon, TB still remains a major public health problem. In 2014, some 26,000 Cameroonians were diagnosed with TB. Information further indicates that 40% of those suffering from TB are co-infected with the HIV [1]. Although 82% of those infected with TB were successfully treated, because of the presence of HIV, the eradication of TB is taking longer than expected [1]. Contact with infectious persons, lack of knowledge on

how to prevent TB, environmental factors like poor ventilation, residential area, gender, and previous history of TB, alcohol and smoking, low CD⁴⁺ T cells are among the risk factors associated with the occurrence of TB in HIV patients on antiretroviral therapy [2]. While some patients suffer from resistance to the TB treatment because they do not strictly take their drugs as required, others develop natural resistance making TB treatment complicated [2].

Treatment of TB is long term and involves a tedious health care procedure. The occurrence of successful outcomes however depends on adherence to the treatment.

Several studies have shown the roles a variety of factors play and their contribution to non-adherence and outcomes of TB. Although the concept of psychological distress is still poorly understood; it is broadly defined as a state of emotional suffering characterized by symptoms of depression and anxiety [3]. It is a leading contributor of the total burden of disease globally [4]. Patients with psychological distress have a greater risk of treatment non adherence, are more likely to exhibit risky behaviors such as unsafe sexual practices, tobacco, smoking and alcohol misuse and suicide attempts [5,6]

2. Materials and Methods

2.1. Study Design

The study was a cross sectional hospital-based survey involving quantitative methods of data collection.

2.2. Study Area and Setting

The study was conducted at the infectious unit of the Buea and Limbe Regional Hospitals. These are state owned hospitals in the South West Region with dedicated units for TB patient's hospitalization. These hospitals accommodate patients from other areas of the South West Region, providing health services to more than 40,000 inhabitants from this part of the country. The Buea Regional hospital has about 160 beds, 6 hospitalization units (pediatrics, maternity, surgical, tuberculosis, male medical and female medical wards), an out-patient department, a diabetic unit, an HIV unit, a laboratory, a surgical operating unit, an X-ray unit, two mortuary units and a canteen. The TB unit is one of the major centres for the diagnosis and treatment of TB in the South West region of Cameroon. This center was created in 2001 and since then, approximately 2,500 patients with HIV/AIDS and or TB have been diagnosed and treated by the center. The centre has 12 staff, some of which are nurses, community relay agents and social workers. The center is divided into two units: pediatric and adult units. This centre accommodates patients from Buea and beyond. Patients registered at the TB centre at the time of the study were included in the study. Limbe Regional Hospital is referred to by locals as Mile 1 Hospital since it is exactly one mile away from the Atlantic Ocean. It has a capacity of 200 beds. The TB unit of the hospital has one medical doctor in charge and nurses who work in shifts every day at the drug dispensation sector of the unit.

2.3. Target Population

All patients with all forms of TB attending the Buea and Limbe TB treatment centers between the months of May and August 2016 were included in the study.

2.4. Inclusion criteria

- The study subjects were patients who tested positive for TB.

- Adult TB patients who were mentally capable of providing consent, and assenting children whose parents gave their consent.
- Patients with all types of TB [pulmonary, extra pulmonary, multidrug-resistant TB (MDR-TB)] being treated under the DOT strategy.

2.5. Exclusion Criteria

TB patients who were seriously sick and bed ridden.

2.6. Sample Size

A sample size formula for prevalence studies was used. The sample size was calculated using a maximum sample size at 95% confidence interval because there is no existing data on the prevalence for psychological distress in TB patients in the South West Region.

$$n = \frac{Z\alpha^2 P(1-P)}{d^2} = \frac{(1.96)^2 \times 0.5 \times (1-0.5)}{0.05 \times 0.05}$$

Where:

Z α = Cutoff value of a standard normal variant at a 95% confidence level (1.96).

P = Proportion of the condition.

d = The precision of estimation at 0.5% (0.05)

$$n = \frac{3.8416 \times 0.25}{0.0025} = 384 \text{ Participants.}$$

2.7. Sampling Method

A simple consecutive method of sampling was used to recruit study participants. All patients present at the time of data collection and who gave their consent and minors whose parents gave their consent were recruited to take part in the study.

2.8. Data Collection Tools

Data were collected using a pre-tested structured questionnaire designed to capture data on socio demographic variables such as age, sex, educational status, employment status, and marital status amongst others from consenting study participants.

Data collection on psychological distress was gotten using the Kessler 10-item (K-10) scale [7]. The scale consists of 10 questions about the level of anxiety and depression symptoms a person has experienced over the preceding period of 30 days. The response categories for each of the 10-items experienced was recorded using a five point Likert scale ranging from 'none of the time' (with a lower score) to 'all of the time' (with a higher score). On the K-10 scale, the higher the total score, the higher the degree of psychological distress related to nonspecific depression, anxiety, and substance abuse [8]. This scale has been widely used to assess common mental disorders among TB patients under treatment and has been validated in several settings [9].

This scale serves to identify individuals who are likely to meet formal definitions for anxiety and/or depressive disorders, as well as to identify individuals with

sub-clinical illness who may not meet formal definitions for specific disorder [7]. The K-10 has been shown to capture variability related to non-specific depression and anxiety but does not measure suicidality or psychoses [10]. This scale is increasingly used in population mental health research and has been validated in multiple settings including HIV positive individuals in South Africa and a population based survey in South Africa [11].

2.9. Data Analysis

Data was entered into Microsoft Excel 2013 and imported into stata 13 for analysis. Descriptive statistics was used to describe frequencies and percentage of age, gender, educational level, marital status, employment status. Data were checked for normality and outliers. Analysis of factors associated with psychological distress, following each univariate regression, multivariable regression models were constructed. Psychological distress was defined by the K-10 > 20, and was further categorized as: those with no distress (<20), mild distress (20 - 24), moderate distress (25 - 29) and severe distress (>30). A 0.05 level of significance was used and 95% confidence level.

2.10. Ethical Considerations

Administrative authorization for the study was obtained from the Regional Delegation of Public Health for the South West Region of Cameroon and the Director of the TB Treatment Centers of Buea and Limbe. Ethical clearance was obtained from the Faculty of Health Sciences Institutional Review Board, University of Buea.

3. Results

3.1. Socio-Demographic Characteristics of the Study Participants

This study involved TB patients who were on treatment at the Buea and Limbe TB treatment centers and on

therapy between May to August 2016. A total of 300 study participants were enrolled into the study. Median age at enrollment into the study was 32 years. Of the 300 study participants interviewed, 182 (62.0%) were single. More than half (53.3%) of the participants were females. In terms of employment status, a greater proportion were unemployed 143 (44%) meanwhile 97 (32%) were employed and 70 (23%) were self-employed. A significant proportion had attended at least primary school 121 (40%) and those who had vocational training made up the minority of the study population. Just 37 (12%) of the study participants had been to the university (Table 1).

3.2. Prevalence of Psychological Distress among TB Patients

Of the 300 TB patients screened for psychological distress, 130 were distressed. The overall prevalence of psychological distress was 43.3% (95%CI: 40.7 - 49.4) as depicted in Figure 1.

The prevalence of mild, moderate and severe psychological distress was 35.3%, 7.0% and 1.0% respectively (Figure 2).

Table 1. Socio-demographic characteristics of the study participants

| Variable | Category | Frequency (%) |
|-------------------|---------------------|---------------|
| Age | 0 -20 | 65 (21.7) |
| | 21 - 34 | 120 (40.0) |
| | 35 and above | 115 (38.3) |
| Gender | Male | 147 (46.7) |
| | Female | 153 (53.3) |
| Educational level | Primary | 121 (40.3) |
| | Secondary | 111(37.0) |
| | Tertiary | 31 (10.3) |
| | Vocational Training | 37 (12.3) |
| Marital status | Single | 186 (62.0) |
| | Married | 114 (38.0) |
| Employment Status | Unemployed | 133 (44.3) |
| | Employed | 97 (32.3) |
| | Self employed | 70 (23.3) |

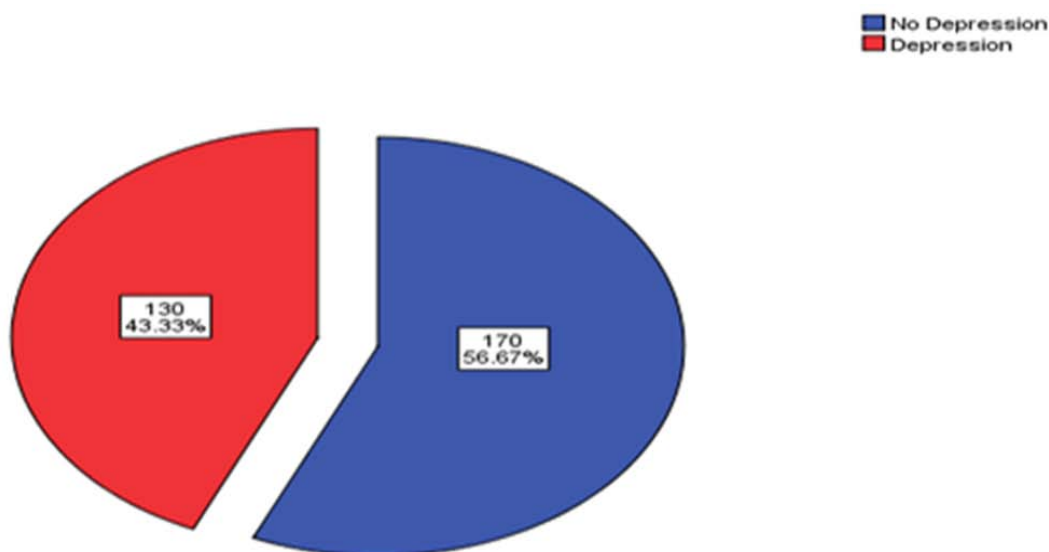


Figure 1. Prevalence of Psychological Distress among TB patients

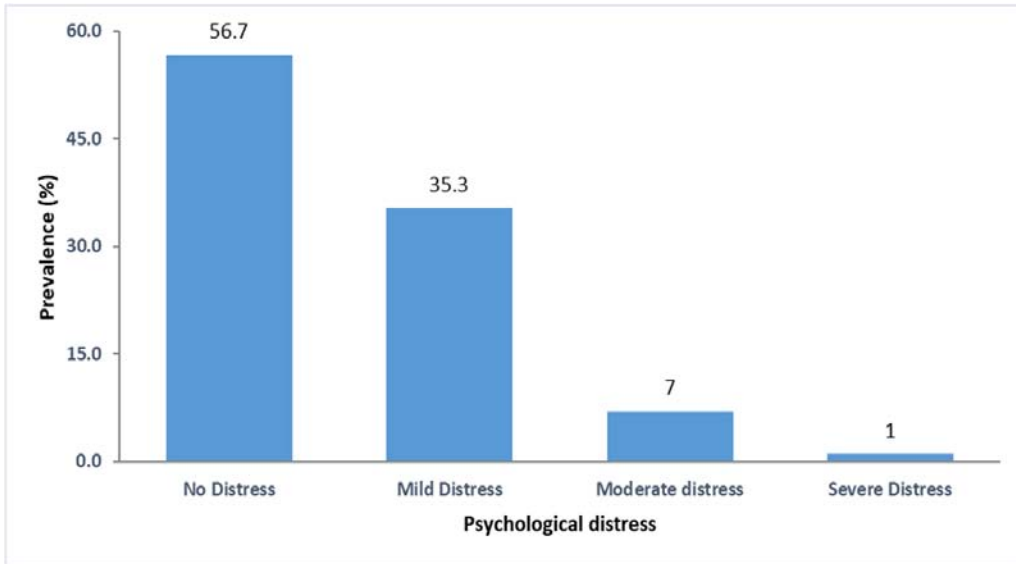


Figure 2. Prevalence of mild, moderate and severe psychological distress

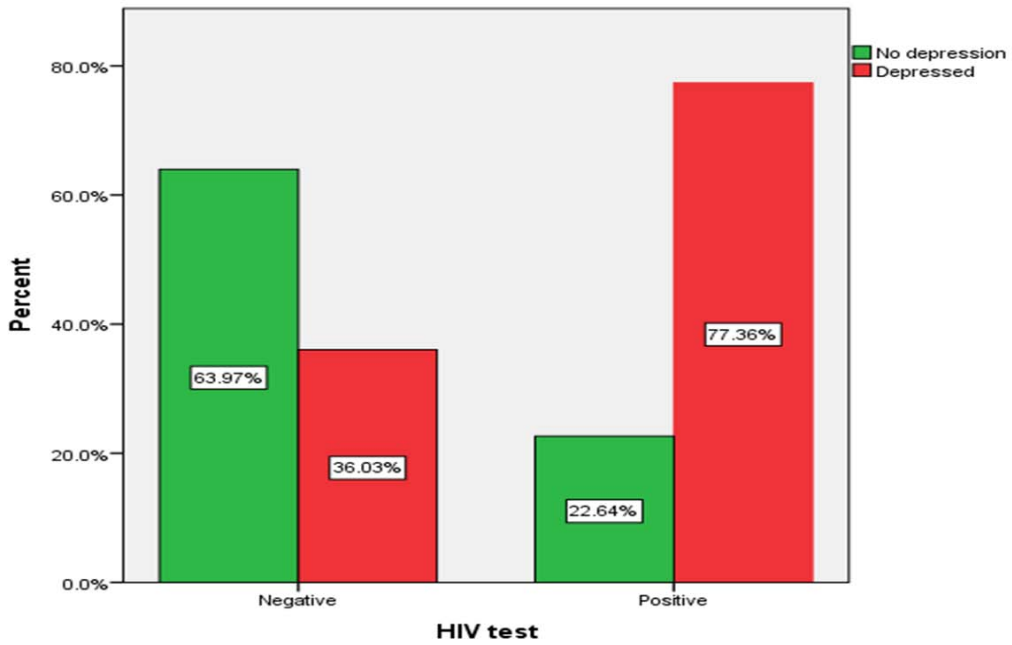


Figure 3. Variation of psychological distress with HIV status among TB patients

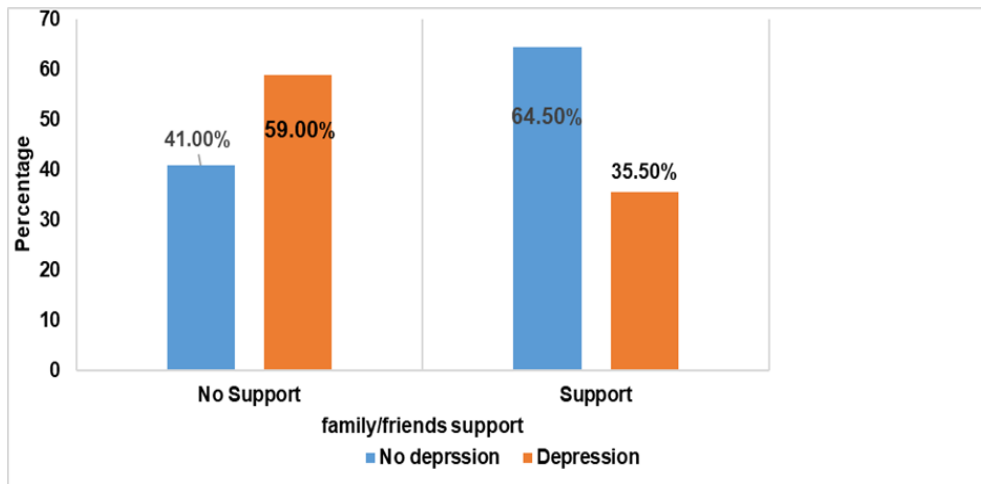


Figure 4. Variation of psychological distress with psychosocial support from family/friends among TB patients

3.3. Variation of Psychological Distress with HIV Status among TB Patients

Of the 300 study participants, 22.6% of them were HIV positive. HIV positive individuals (77.4%) were significantly ($p < 0.05$) more likely to be distressed compared to their HIV negative (36.0%) counterparts (Figure 3).

3.4. Variation of Psychological Distress with Psychosocial Support from Family/Friends among TB Patients

About 35% of TB patients who received care and support from family/friends were distressed as compared to 59% who did not receive any support. (Figure 4).

3.5. Risk Factors of Psychological Distress among TB Patients

Being HIV positive (AOR = 6.10, 95% CI: 2.64- 14.01), having a LSES (AOR = 2.50, 95% CI: 1.04 - 4.12), not

receiving support from family members (AOR= 2.65; 95% CI: 1.60 - 4.32) and family history of psychological distress (AOR= 2.3; 95% CI: 1.01 - 4.02) significantly increased the odds of being psychologically distressed among TB patients receiving treatment in the Buea and Limbe Treatment centers (Table 2).

4. Discussion

4.1. The Prevalence of Psychological Distress in TB Patients

The prevalence of 43.3% (K-10 > 20) found in our study was lower than that in South Africa which reported a prevalence of 81.0% (K-10 \geq 16) [9]. It is possible that decreased rates of psychological distress were found in this study because the assessment included patients who had been on treatment for a relatively long time (above one month) of diagnosis and signs might not have persisted at the later stage of the disease course or upon completion of TB treatment.

Table 2. Risk factors of psychological distress among TB patients in Buea and Limbe Treatment centers

| Characteristics | Psychological Distress (K-10) Score (≥ 20) | | | |
|--|---|-------------------|----------------------|----------|
| | Category | Crude OR (95% CI) | Adjusted OR (95% CI) | p- value |
| | 0 -20 | 1 | 1 | |
| Age categories | 21 - 34 | 1.28 (0.57-2.77) | 1.29 (0.59-2.79) | 0.518 |
| | 35 and above | 1.31 (0.52-3.55) | 1.33 (0.53-3.56) | 0.552 |
| | Male | 1 | 1 | |
| Gender | Female | 0.67 (0.67-1.14) | 0.69 (0.41-1.17) | 0.171 |
| | Primary | 1 | 1 | |
| Educational level | Secondary | 0.96 (0.52-1.72) | 0.97 (0.54-1.74) | 0.918 |
| | Tertiary | 0.86 (0.34-2.14) | 0.89 (0.37-2.16) | 0.798 |
| | Vocational Training | 0.50 (0.22-1.33) | 0.52 (0.21-1.32) | 0.170 |
| Marital status | Single | 1 | 1 | |
| | Married | 1.08 (0.54-2.14) | 1.06 (0.53-2.13) | 0.860 |
| | Unemployed | 1 | 1 | |
| Employment Status | Employed | 1.13 (0.42-2.90) | 1.15 (0.45-2.92) | 0.771 |
| | Self employed | 0.72 (0.27-1.92) | 0.73 (0.28-1.93) | 0.530 |
| Smoking | No | 1 | 1 | |
| | Yes | 1.04 (0.54-1.90) | 1.03 (0.56-1.91) | 0.108 |
| HIV co-infection | No | 1 | 1 | |
| | Yes | 6.09 (2.6-14.0) | 6.10 (2.5-14.3) | 0.004* |
| Support from family/friends | Yes | 1 | 1 | |
| | No | 2.66 (1.50-4.67) | 2.65 (1.60-4.32) | 0.034* |
| Family history of psychological distress | No | 1 | 1 | |
| | Yes | 2.3 (1.01-4.02) | 2.40 (1.03-4.03) | 0.036* |
| Socio-economic status | HSES | 1 | 1 | |
| | MSES | 1.03 (0.53-2.35) | 1.02 (0.41-2.14) | 0.542 |
| | LSES | 2.52 (1.41-4.74) | 2.50 (1.04-4.12) | 0.022* |

The prevalence of psychological distress among patients co-infected with HIV in our study was significantly higher (77.4%) than that in previous studies (7.0% - 63.0%) [12,13,14]. Such variations may be explained by the different instruments used to diagnose depression and methodological differences, such as cutoff points, differences in the study population. The uncertainty of the perfect cut off score as regard the K-10 is considered as a major limitation of the study. Several studies showed that the K-10 scale had good psychometric properties [15,16] and can discriminate between cases and non-cases reported in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). Differences in prevalence of psychological distress cited in the study could be attributable to several factors including the population being studied, the hospitalized environment of the patients, the study periods during the TB treatment course and the HIV status of the patient [17].

The study found out in multivariate analysis that lower income status (participants who earned below 50,000 fcfa) was associated with psychological distress. Low socioeconomic status has also been found in other studies to be associated with common mental disorders in TB patients [18]. Most studies in developing countries showed an association between indicators of poverty and the risk of mental disorders. Many patients in low and middle income countries suffer from common mental disorders because of the stress caused by poverty [19] coupled with factors such as hopelessness and rapid social change. Physical ill-health may explain the greater vulnerability of the poor to be distressed. Financial stability of patients may reduce their levels of depression, and ameliorate their compliance rate to anti-TB medication and certainly and ultimately result in an improved quality of life [20,21,22].

No significant association between gender and psychological distress was recorded in the study. And also there was no association between age, educational level, marital status and employment status. This could be due to the fact that most participants were not giving their correct ages and marital status, and even the small sample size could have resulted to this. This is in contrast with findings of most studies carried out in Africa [9,14].

Although we were not able to find a sufficiently similar study to compare to our findings on the association between family history of common mental illness and psychological distress, a study reported by [23], found that family functioning as measured by the APGAR-Scale was significantly negatively associated with the K- 6 distress score. Prior studies conducted in Western and Eastern countries have also reported that family dysfunction is strongly associated with mental disorders [24,25]. Few studies, however, have so far provided support for the association between family functioning and psychiatric comorbidity in Nepal [26]. A study by [27] in India revealed that sources of distress in the family could be parental deaths, inter-parental conflicts, unfulfilled needs and wants, mental illness, parental substance addiction, parental divorce and disharmony. Deficits in family functioning may lead to experience of distress and subsequent increase in substance use. Moreover, a study by [28] found that individuals who do not have an

intimate and supportive relationship within their family are more likely to be attracted by and inclined towards friends and groups of their own age and become more susceptible to using drugs in the social context of these peer groups, which again later may cause psychological problems. Family support is an important factor in conceptualizing primary care patient problems. Numerous examples of how the family system determines the course of chronic illness have been influential in the development of collaborative medical care [29].

We found that the absence of family and friends support was associated with higher rates of being psychologically distressed (K-10 >20), as compared to those who had family support. This observation is in correlation with findings of [30]. We also found that patients who perceived dissatisfying family support and who rated their health status as poor reported the most (moderate and severe) psychological distress on the K-10 and However, participants with satisfying family support, regardless of their self-rated health, reported little psychological distress. These results make sense from family function perspectives [31,32] cognitive-behavioral and interpersonal models of depression, and behavioral medicine perspectives [33].

Being TB/HIV co-infected was found to be associated with a higher rate of psychological distress (using the K-10 cut off of ≥ 20) than among non-co-infected patients. This finding is consistent with reports from another study [34]. Being diagnosed with HIV which is a life-long disease associated with high levels of stigma, may also lead to higher rates of mental disorder. The study findings were similar to those reported in the study from the Oromia Region of Ethiopia [17], which found that 64% of TB patients with HIV displayed symptoms of psychological distress.

Limitations of the Study

The K-10 scale evaluates participant's feelings during the past 30 days but the study included patients who had been on treatment for more than 30 days consequently, some patients may have forgotten the exact way they were feeling during the period of diagnosis.

Conclusions

- The prevalence of psychological distress among TB patients in the Buea and Limbe Regional Hospitals was 43.3% with most of the participants having mild to moderate distress.
- Risk factors associated with psychological distress were: testing HIV+, no family support, lower SES and family history of common mental illness.

Recommendations

- Physicians should routinely watch out for psychological distress in all TB patients and manage them as need be. Attention should be given to patients who present with major life event and neuropathy.

- Patients should be given proper educative talks on their TB condition so as to encourage positive behaviour change.
- Physicians should create awareness of the availability of counseling to TB patients.

Perspectives

More research should be conducted regarding the effects of psychosocial interventions on health outcome of TB patients and even those co-infected with HIV. Currently, the literature is equivocal in its ability to indicate whether psychosocial treatments can have an impact on health outcome, while well controlled investigations capable of addressing such a question requires extensive resources, preliminary results suggest that such efforts may be worthwhile.

List of Abbreviations

AFB: Acid Fast Bacilli.
AIDS: Acquired immunodeficiency syndrome
CD4: Cluster of Differentiation
CMDs: Common Mental Disorders
DALYs: Disability Adjusted Life Years
DOTS: Direct Observed Treatment
E: Ethambutol
H: Isoniazid
HIV: Human Immune Virus
K-10: Kessler 10-item Scale
MDR-TB: Multi-Drug Resistant Tuberculosis
NGOs: Non-Governmental Organizations
NTCP: National Tuberculosis Control Programme
PTB: Pulmonary Tuberculosis
R: Rifampicin
S: Streptomycin
TB: Tuberculosis
TST: Tuberculin Skin Test
WHO: World Health Organization
Z: pyrazinamide

Competing Interests

The authors declare that they have no competing interests.

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References

- [1] NPFTB: National Program for the Fight against TB: *Annual report 2014*
- [2] Pennap, G. Makpa, S. Ogbu, S. Sero-prevalence of HIV infection among tuberculosis patients in a rural tuberculosis referral clinic in Northern Nigeria. *Pan African medical journal*. 2010; (5): 22.
- [3] Drapeau, A. Marchand, A. and Beaulieu-Prevost, D. Epidemiology of psychological distress. Mental Illnesses Understanding, Predict Control. *In Tech Open Access*. 2011; 105-134.
- [4] Wittchen, H.U. Jacobi, F. Rehm, J. Gustavsson, A. Svensson, M. Jonsson, B. Olesen, J. Allgulander, C. Alonso, J. Faravelli, C. Fratiglioni, L. Jennum, P. Lieb, R. Maercker, A. Vanos, J. Preisig, M. Salvador-Carulla, L. Simon, R. and Steinhausen, H.C. The size and burden of mental disorders and other disorders of the brain in Europe 2010. *European Neuropsychopharmacology*. 2011
- [5] De Hert, M. Cohen, D. Bobes, J. Cetkovich-Bakmas, M. Leucht, S. Ndeti, D.M. Newcomer, J.W, Uwakwe, R. Asai, I. Möller, H.J. Gautam, S. Detraux, J. and Correll, C.U. Physical illness in patients with severe mental disorders II. Barriers to care, monitoring and treatment guide-lines, plus recommendations at the system and individual level. *World Psychiatry*. 2011;10: 138.
- [6] Pasco, J.A. Williams, L. Jacka, F. N. Ng, F. Henry, M. J. Nicholson, G. C. Kotowicz, M.A. and Berk, M. Tobacco smoking as a risk factor for major depressive disorder: population-based study. *British Journal of Psychiatry*. 2008;193 (4): 322-326.
- [7] Kessler, R. C. Aguilar-Gaxiola, S. Alonso, J. Chatterji, S. Lee, S. and Ormel, J. (2011). The global burden of mental disorders: an update from the WHO World Mental Health (WMH) surveys. *Epidemiology Psychiatry Soc*. 2011; 18: 23-33.
- [8] Kriegsman, D.M.W, Penninx, B.W.H.J and Van E. J.T.M. A criterion-based literature survey of the relationship between family support and incidence and course of chronic disease in the elderly. *Families, Systems and health Medicine*. 1995; 13: 39-68.
- [9] Peltzer, K. Naidoo, P. Maseke, G. Louw, J. Mchunu, G. and Tutshana, B. Prevalence of psychological distress and associated factors in tuberculosis patients in public primary care clinics in South Africa. *BMC Psychiatry*. 2012; 12: 89.
- [10] Brooks, R.T. Beard, J. and Steel, Z. Factor structure and interpretation of the K10. *Psychological Assessment*. 2006; 18 (1): 62-70.
- [11] Andersen, L.S. Grimsrud, A. Myer, L. Williams, D.R. Stein, D.J. and Seedat, S. The psychometric properties of the K10 and K6 scales in screening for mood and anxiety disorders in the South African Stress and Health study. *International Journal of Methods in Psychiatry Research*. 2011; 20(4): 215-223.
- [12] Dye, C. Scheele, S. Dolin, P. Pathania, V. and Raviglione, M. C. Global burden of tuberculosis: estimated incidence, prevalence,

- and mortality by country. *Journal of the American Medical Association*. 1999; 282 (7): 677-686.
- [13] Masumoto, S.Yamamoto, T. Ohkado, A. Yoshimatsu, S. Querri, A.G. and Kamiya, Y. Prevalence and associated factors of depressive state among pulmonary tuberculosis patients in Manila, The Philippines. *International Journal of Tuberculosis and Lung Disease*. 2014; 18: 9-174.
- [14] Sulehri, M.A. Dogar, I.A. Sohail, H. Mehdi, Z. Azam, M. and Niaz, O. Prevalence of depression among tuberculosis patients. *Annual Punjab Medical College journal*. 2010; (4): 7-133.
- [15] Spies, G. Kader, K. Kidd, M. Smit, J. Myer, L. Stein, D.J. and Seedat, S. Validity of the K-10 in detecting DSM-IV-defined depression and anxiety disorders among HIV-infected individuals. *AIDS Care*. 2009; 21 (9): 1163-1168.
- [16] Andrews, G. and Slade, T. (2001). Interpreting scores on the Kessler Psychological Distress Scale (K10). *Australian and New Zealand Journal of Public Health*. 25: 494-497.
- [17] Deribew, A. Tesfaye, M. Hailmichael, Y. Apers, L. Abebe, G. Duchateau, L. and Colebunders, R. Common mental disorders in TB/HIV co-infected patients in Ethiopia. *BMC Infectious Disease*. 2010; 10: 201.
- [18] Patel, V. Kleinman, A. Poverty and common mental disorders in developing countries. *Bull World Health Organ*. 2003; 81 (8): 609-615.
- [19] Araya, R. Rojas, G. Fritsch, R. Acuna, J. and Lewis, G. Common mental disorders in Santiago, Chile: prevalence and socio-demographic correlates. *British Journal of Psychiatry*. 2001; 178:228-233.
- [20] Sulehri, M.A. Dogar, I.A. Sohail, H. Mehdi, Z. Azam, M. and Niaz, O. Prevalence of depression among tuberculosis patients. *Annual Punjab Medical College journal*. 2010; (4): 7-133.
- [21] Sulehri, M.A. Dogar, I.A. Sohail, H. Mehdi, Z. Azam, M. and Niaz, O. Prevalence of depression among tuberculosis patients. *Annual Punjab Medical College journal*. 2010; 4(2): 133-137.
- [22] Seedat, S. Scott, K.M. Angermeyer, M.C. Berglund, P. Bromet, E.J. Brugha, T.S. Demyttenaere, K. de Girolamo, G. Haro, J.M. Jin, R. Karam, E.G. Kovess-Masfety, V. Levinson, D. Medina, M.M.E. Ono, Y. Ormel, J. Pennell, B. Posada-Villa, J. Sampson, N.A. Williams, D. and Kessler, R.C. Cross-national associations between gender and mental disorders in the World Health Organization World Mental Health Surveys. *Archives of General Psychiatry*. 2009; 66(7): 785-795.
- [23] Rohrer, J. Rohland, B. Denison, A. Pierce, and J.R. Rasmussen, N.H. Family history of mental illness and frequent mental distress in community clinic patients. *Journal of Evaluation in Clinical practice*. 2009; 13 (3): 435-9.
- [24] Armsden, G.C. McCauley, E. Greenberg, M.T. Burke, P.M. Mitchell, J.R. Parent and peer attachment in early adolescent depression. *Journal of Abnormal Child Psychology*. 1990; 18(6): 683-97.
- [25] Huang, J.P. Xia, W. Sun, C.H. Zhang, H.Y. and Wu, L.J. Psychological distress and its correlates in Chinese adolescents. *Australian and New Zealand Journal of Psychiatry*. 2009; 43 (7): 674-80.
- [26] Lamichanne, N. Shyangwa, P.M and Shakya, R. Family burden in substance dependence syndrome. 2008
- [27] Krishnakumar, P. Geeta, M.G and Riyaz, A. Deliberate self-harm in children. *Indian Pediatrics*. 2011; 48 (5): 367-71.
- [28] Hosseinbor, M. Bakhshani, N. M and Shakiba, M. Family functioning of addicted and non-addicted individuals: a comparative study. *International Journal of High Risk Behaviour and Addiction*. 2012; 1(3): 109-14.
- [29] Salla, A. Simon, M. Helen, J. Mark, E. Atle, F. Jimmy, V. and Barbara, R. Patient's adherence to Tuberculosis Treatment: A Systematic Review of Qualitative Research. *Plos medicine*. 2007; 4(7): 10-13.
- [30] Cano, A. Douglas, J. S. Robert, P. S. Larry, J. L. Barbara ,H. Fiese, and Frank Brand. Family Support, Self-Rated Health, and Psychological Distress. *Journal of clinical psychiatry*. 2003; 5 (3): 111-117.
- [31] Minuchin S, Rosman BL, and Baker L. *Psychosomatic Families: Anorexia Nervosa in Context*. Cambridge, Mass: Harvard University Press. 1978
- [32] Simon, F.B. Stierlin, H. and Wynne, L.C. *The Language of Family Therapy: A Systemic Vocabulary and Sourcebook*. New York, NY: Family Process Press. 1985; 141-143.
- [33] Turk, D.C. Meichenbaum, D. and Genest, M. *Pain and Behavioral Medicine: A Cognitive-Behavioral Perspective*. New York, NY: Guilford Press. 1983.
- [34] Pezzoni, V. and Kouimtsidis, C. Screening for alcohol misuse within people attending a psychiatric intellectual disability community service. *Journal of Intellectual Disability Research*. 2015.

