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# Psychological Distress in Adult Pulmonary Tuberculosis Sufferers: A Community-Based Survey

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## ABSTRACT

**Objective:** This study aims to assess the prevalence and emotional symptoms of psychological distress in pulmonary tuberculosis (TB) sufferers.

**Methods:** This cross-sectional study was conducted at six primary health centers in Makassar City, Indonesia from June to November 2022. TB patients were diagnosed using national TB program guidelines. The study included patients 18-60 years old, did not have psychosis or communication difficulties, had no difficulty understanding the questionnaire's contents and were capable to following the study protocols. Self-designed questionnaires were used to obtain data on sociodemographic characteristics and medical conditions. The outcome of the study was psychological distress among individuals with pulmonary TB, which was measured using the Kessler Psychological Distress Scale (K10).

**Results:** Of total 308 TB patients, the mean age was 40.88 ± 16.09 years. Psychological distress was observed in 239 (77.6%) patients. The median psychological distress was found significantly higher in patients with older age (p-value 0.041), senior high school (p-value 0.046), unemployed (p-value <0.001), had a monthly income below the regional minimum wage (p-value 0.015), smokers (p-value 0.049), and had abnormal blood pressure (p-value <0.001). Moreover, it was observed that tiredness (2.44 ± 0.06), fidgety (2.98 ± 0.06), sadness (2.04 ± 0.06), and hopelessness (2.02 ± 0.05) were prominent symptoms experienced by TB patients due to psychological distress.

**Conclusion:** More than three-fourths of TB patients experienced psychological distress. Smoking and abnormal blood pressure, along with specific demographic factors, significantly influenced distress levels. Prominent emotional symptoms in distressed patients included fatigue, restlessness, sadness, and hopelessness.

**Keywords:** Emotional Distress, Psychological Distress, Pulmonary Tuberculosis.



## INTRODUCTION

Indonesia is a low and middle-income country with the third highest prevalence of pulmonary tuberculosis (TB), after India and China. It is reported that in Indonesia, there are 824,000 TB new cases and 93,000 deaths per year; this number of deaths is equal to 11 deaths per hour. In Indonesia, the productive age group, particularly those aged 45 to 54 years, has the largest number of TB cases.[1] In 2019, it is estimated that 10 million people were infected with TB, and 1.41 million people died from the disease worldwide; these numbers are nearly similar to those in 2018.[2]

Psychological distress is more prevalent in TB patients in developing countries; people with TB infection are more subject to psychological pressure than those without TB.[3] Psychological distress is described as an unpleasant subjective state of depression and anxiety. Moreover, psychological distress results in emotional and physiological manifestations that interfere with daily life activities characterized by depression, anxiety, and somatic symptoms. Psychological distress can lead to a poor perception of the environment, oneself, and others.[4]

Mental problems are often neglected; thus, these problems must get attention in TB treatment because mental health affects a patient's adaptation to the disease.[5] Several studies investigated common mental disorders in TB patients in low and middle-income countries and have discovered high rates of general mental disorders as follows: Pakistan for 46.3%-80%,[6] Nigeria for 27.7%-30%,[7] Ethiopia for 64 %,[8] India for 76%,[9]

and South Africa for 46 %.[10] More than 80% of the disease burden occurs in low- and middle-income countries.[11]
In addition, such an issue is still frequently neglected in Indonesia. It is pivotal to obtain accurate data on the prevalence and predictors of psychological distress problems in pulmonary TB patients in Indonesia whose society is multicultural. Based on the aforementioned explanation, this study aims to identify the prevalence and emotional symptoms of psychological distress in pulmonary TB patients in eastern Indonesia.

## METHODS

This cross-sectional study was conducted at six primary health centers (PHC) in Makassar City, South Sulawesi Province, Indonesia from June to November 2022. South Sulawesi Province is one of the regions in the eastern part of Indonesia, which ranks seven with the highest prevalence of TB in Indonesia. Six PHCs were selected because the highest number of TB patients was found there. The Ethics Committee of Nani Hasanuddin Health Institute approved this study number (0395b/STIKES-NH/KEPK/V/2022). All participants provided informed consent, participated voluntarily, and signed a consent form.
The inclusion criteria were TB patients diagnosed using national TB program guidelines, were 18-60 years old, did not have psychosis or communication difficulties, had no difficulty understanding the questionnaire's contents, and could comply with study protocols. The exclusion criteria were patients who had completed their treatment. Initially, the estimated sample size of 240 was calculated using Open Epi taking 50% proportion of the condition.[12] However, to adjust for non-response and incomplete data, 312 TB patients were included. Later on, four questionnaires were removed due to a considerable amount of missing information. Therefore, 308 patients' data were finally included in the study.
At baseline, demographic items assessed participants' characteristics, including age, sex, education, occupation, income, smoking behavior, body mass index (BMI) (skinny: 17.0-18.4, normal: 18.5-22.9, overweight: 23.0-24.9, obesity: ≥ 25.0), upper arm circumference (underweight: < 90%, normal: 90-100%, overweight: 110-120%), and blood pressure. Self-designed questionnaires were used to obtain data on sociodemographic characteristics and medical conditions.
The outcome of the study was psychological distress among individuals with pulmonary TB, which was measured using the Kessler Psychological Distress Scale (K10).[13] This scale consisted of 10 items. Emotional disorders as a manifestation of psychological distress manifest in a variety of symptoms include sad, tired, nervous, hopeless, fidgety, effortless, depressed, worthless. They reported their distress over the past 30 days using a five-point Likert scale ranging from 1 = never to 5 = all of the time. An item score of 10-19 indicates likely to be well; 20-24 indicates likely to have a mild disorder; 25-29 indicates likely to have a moderate disorder; 30-50 indicates likely to have a severe disorder.[13]Instrument was translated into Indonesian by Sitompul. The reliability and validity of the translated version were also verified. Overall Cronbach's alpha coefficient of the scale is 0.931, and the content validity is 0.834.[14]
Statistical Package for Social Sciences (SPSS) version 24 was used for the purpose of statistical analysis. The mean ± SD was calculated for age, and the median interquartile range (IQR) was computed for the psychological distress score. Frequencies and percentages were calculated for gender, education, occupation, Income, smoking, BMI, upper arm circumference, blood pressure, and emotional disorders. Normality of the data was checked by Shapiro-Wilk test. The data were not normally distributed, therefore non-parametric tests were applied. Inferential statistics were explored using Mann-Whitney U test and Kruskal-Wallis test to compare psychological distress scores with demographic and clinical characteristics of TB patients. The p-value of ≤0.05 was considered as significant.

## RESULTS

This study was completed on 308 TB patients with a mean age of 40.88 ± 16.09 years. There were 161 (52.3%) females and 147 (47.7%) males. Nearly one-third of the participants had an elementary school education 56 (18.2%) or a lower level of education 59 (19.2%). The majority of the patients were unemployed and had monthly income below the regional minimum wage i.e., 159 (51.6%) and 265 (86.0%). Most of the patients were non-smokers 167 (54.2%), had normal blood pressure 160 (51.9%), had normal BMI 157 (51.0%), and had underweight upper arm circumference 216 (70.1%).
Psychological distress was observed in 239 (77.6%) patients. Among them 116 (37.7%) had mild distress, 74 (24.0%) had moderate distress and 49 (15.9%) had severe distress. The median psychological distress was found significantly higher in older age (p-value 0.041) patients, those studied senior high school (p-value 0.046), were unemployed (p-value <0.001), had a

monthly income below the regional minimum wage (p-value 0.015), smokers (p-value 0.049), and had abnormal blood pressure (p-value <0.001) (Table 1 & 2). TB patients experience various symptoms of emotional disorders. The mean of the most prominent items are as follows tiredness (2.44 ± 0.06), fidgety (2.98 ± 0.06), sadness (2.04 ± 0.06), and hopeless (2.02 ± 0.05). Moreover, tiredness fidgety, sadness, and hopelessness consistently experiencing in 45 (14.6%), 29 (9.4%), 9 (2.9%), and 21 (6.8%) patients respectively (Table 3).

**Table 1: Comparison of psychological distress scores with demographic characteristics of TB Patients (n=308)**

| Variables | Total | Psychological Distress Scores Median (IQR) | p-value |
|---|---|---|---|
| **Age (years)** | | | |
| 25-34 | 22 | 24 (21-30) | 0.041~* |
| 35-44 | 230 | 22 (19-27) | |
| 45-60 | 56 | 26 (21-29) | |
| **Gender** | | | |
| Male | 147 | 23 (20-28) | 0.068^ |
| Female | 161 | 22 (19-27) | |
| **Education** | | | |
| Not Attending Schools | 44 | 21.5 (18.5-26.5) | 0.046~* |
| Elementary Schools | 56 | 24 (20-28.5) | |
| Junior High Schools | 59 | 21 (18.5-28) | |
| Senior High Schools | 100 | 24.5 (20.5 – 28) | |
| Higher Education | 49 | 20 (18-26) | |
| **Occupation** | | | |
| Working | 149 | 21 (18-26) | <0.001^* |
| Unemployed | 159 | 24 (21-29) | |
| **Income** | | | |
| ≤ Regional Minimum Wage | 265 | 23 (20-28) | 0.015^* |
| > Regional Minimum Wage | 43 | 20 (18-25) | |

-TB: Tuberculosis, IQR: Inter quartile range, Regional minimum wage: 3,385,145 Indonesian Rupiah (IDR)
^Mann-Whitney U test applied, ~Kruskal-Wallis test applied, *p-value ≤ 0.05

**Table 2: Comparison of psychological distress scores with clinical characteristics of TB Patients (n= 308)**

| Clinical characteristics | Total | Psychological Distress Scores Median (IQR) | p-value |
|---|---|---|---|
| **Smoking** | | | |
| Yes | 141 | 22 (19-26) | 0.049^* |
| No | 167 | 21 (18-26) | |
| **Body Mass Index (kg/m$^2$)** | | | |
| Skinny | 124 | 21 (19-26) | 0.156~ |
| Normal | 157 | 24 (19-29) | |
| Overweight | 24 | 24 (19.5-27) | |
| Obesity | 3 | 26 (24-27) | |
| **Upper Arm Circumference** | | | |
| Underweight | 216 | 22 (19-28) | 0.380~ |
| Normal | 80 | 21 (19-27) | |
| Overweight | 12 | 26.5 (13-29) | |
| **Blood Pressure** | | | |
| Normal | 160 | 21 (18-27) | <0.001^* |
| Abnormal | 148 | 25 (21-28.5) | |

-TB: Tuberculosis, IQR: Inter quartile range
^Mann-Whitney U test applied, ~Kruskal-Wallis test applied, *p-value ≤ 0.05

**Table 3: Emotional disorders as a manifestation of psychological distress in TB Patients**

| Emotional Disorders | n (%) | Item Average Scores |
|---|---|---|
| **Tired** | | |
| Never | 32 (10.4) | 2.44 ± 0.06 |
| Seldom | 49 (15.9) | |
| Sometimes | 93 (30.2) | |
| Often | 89 (28.9) | |
| Always | 45 (14.6) | |
| **Nervous** | | |
| Never | 78 (25.3) | 1.79 ± 0.06 |
| Seldom | 94 (30.5) | |
| Sometimes | 69 (22.4) | |
| Often | 43 (14.0) | |
| Always | 24 (7.8) | |
| **Hopeless** | | |
| Never | 89 (28.9) | 2.02 ± 0.05 |
| Rarely | 80 (26.0 | |
| Sometimes | 58 (18.8) | |
| Often | 60 (19.5) | |
| Always | 21 (6.8) | |
| **Fidgety** | | |
| Never | 136 (44.2) | 2.98 ± 0.06 |
| Rarely | 72 (23.4) | |
| Sometimes | 49 (15.9) | |
| Often | 22 (7.1) | |
| Always | 29 (9.4) | |
| **Depressed** | | |
| Never | 167 (54.2) | 1.92 ± 0.05 |
| Rarely | 67 (21.8) | |
| Sometimes | 41 (13.3) | |
| Often | 24 (7.8) | |
| Always | 9 (2.9) | |
| **Effortless** | | |
| Never | 65 (21.1) | 1.86 ± 0.05 |
| Rarely | 51 (16.6) | |
| Sometimes | 32 (10.4) | |
| Often | 80 (26.0) | |
| Always | 80 (26.0) | |
| **Sad** | | |
| Never | 145 (47.1) | 2.04 ± 0.06 |
| Rarely | 88 (28.6) | |
| Sometimes | 45 (14.6) | |
| Often | 21 (6.8) | |
| Always | 9 (2.9) | |
| **Worthless** | | |
| Never | 176 (57.1) | 1.80 ± 0.05 |
| Rarely | 80 (26.0) | |
| Sometimes | 33 (10.7) | |
| Often | 9 (2.9) | |
| Always | 10 (3.2) | |

-TB: Tuberculosis

## DISCUSSION

TB remains a significant public health concern, particularly in low-income communities like the one in our study. This community-based survey aimed to assess psychological distress in adult pulmonary TB sufferers within the Pakistani population, shedding light on various socio-demographic factors and associated symptoms of emotional distress.

The findings of this study revealed that a substantial portion of the TB patients experienced psychological distress, with seventy eight percent of participants reporting symptoms of distress. This high prevalence of psychological distress among TB patients is consistent with findings from previous studies conducted in India,[15] East China,[16] Ethiopia,[3] and South Africa.[17] The difference in prevalence is probably caused by background, culture, social aspects, economy, and patient population. The condition of TB patients is worsened by the COVID-19 pandemic, which causes delays in patient care, diagnosis, and clinical conditions.

The current study revealed that TB patients experienced psychological distress. The distress causes various symptoms, such as anxiety, sadness, despair, and depression. The emergence of psychological distress can result in a number of undesirable effects, including poor treatment results,[18] increased morbidity and death, and increased medication resistance risk.[19] However, proper interventions can minimize psychological distress.[20] As a result, it is critical to investigate effective intervention options to address this issue.

On demographic factors, the median psychological distress was found significantly higher in older age patients. This finding is consistent with a study in Ethiopia.[3] Another study found that older age correlates with psychological distress. This could happen because older TB patients are a vulnerable group with greater health issues, a high death rate, and are more likely to experience severe medication reactions.[21]

In addition, this current study has discovered that a patient with a higher education level can experience greater psychological distress. A previous study asserts that education is a risk factor for depression.[22] However, this finding disagrees with a previous study stating that general mental disorders are more common in healthy persons with lower levels of education.[23] Patients with lower levels of education might not understand TB correctly, often experience confusion about whether TB is curable, and are emotionally disturbed after being diagnosed with the disease. Such conditions can easily lead to psychological distress. In addition, another study has found that patients with lower levels of health literacy experience more psychological distress.[24] A low education level has become a barrier for TB patients because they have limited or no ability to search for health information and only receive information from their care providers; consequently, health literacy declines.

This study has discovered that the high economic burden of TB treatment contributes to higher degrees of psychological distress in TB patients. Patients with a high economic burden are more likely to have low incomes and come from low-income families, both are factors of psychological distress.[25] Furthermore, the increased economic burden complicates patients paying for higher drug costs and examination costs in the long run. Such conditions will cause significant psychological stress.[25] A previous study also showed that about fifty percent of the patients fail to return to work effectively even a year following treatment.[26] Inability to work normally can hamper their income, burden the economic conditions of poor families, and trigger the patients as a burden to their families. Such conditions cause psychological stress. Providing financial support to patients can minimize levels of psychological distress as well as improve treatment adherence, quality of life, and treatment results.[17]

The study also investigated the specific symptoms of emotional distress experienced by TB patients. Notably, symptoms such as tiredness, fidgetiness, sadness, and hopelessness were frequently reported. These symptoms may reflect the psychological burden of living with a chronic illness and the social stigma often attached to TB, both of which can affect a patient's emotional well-being.

This study provides substantial proof of an increased proportion of psychological distress among adult pulmonary TB sufferers. However, it has certain limitations. One limitation of this study is its cross-sectional design, which limits our ability to establish causality. Second, the study was conducted in a specific geographic area, potentially limiting the generalizability of the findings to broader populations of TB sufferers. Based on these limitations, further research is recommended to employ more accurate sampling methods (randomization) to prevent the risk of selection bias and investigate innovative therapies for TB patients' psychological distress.

## CONCLUSION

This study concludes that more than three-fourths TB

patients were found with psychological distress. Factors such as older age, lower education levels, unemployment, inadequate income, smoking, and abnormal blood pressure were associated with median psychological distress scores. Prominent emotional symptoms among distressed TB patients included tiredness, fidgetiness, sadness, and hopelessness. Addressing the psychological well-being of pulmonary TB sufferers is crucial alongside their physical health.

**ETHICAL APPROVAL:** This study was approved by the Ethics Committee of Nani Hasanuddin Health Institute (Ref. No.0395b/STIKES-NH/KEPK/V/2022).

**AUTHORS' CONTRIBUTION:** SS: Contributed to the study design, data interpretation and review of the final manuscript. YH & IL: Jointly proposed the study, analysed the data and prepared the final draft.
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