p-ISSN 2407-0831
e-ISSN 2621-8372

JURNAL RESPIRASI

(*Journal of Respirology*)

JR

Volume 10, Number 2 May 2024

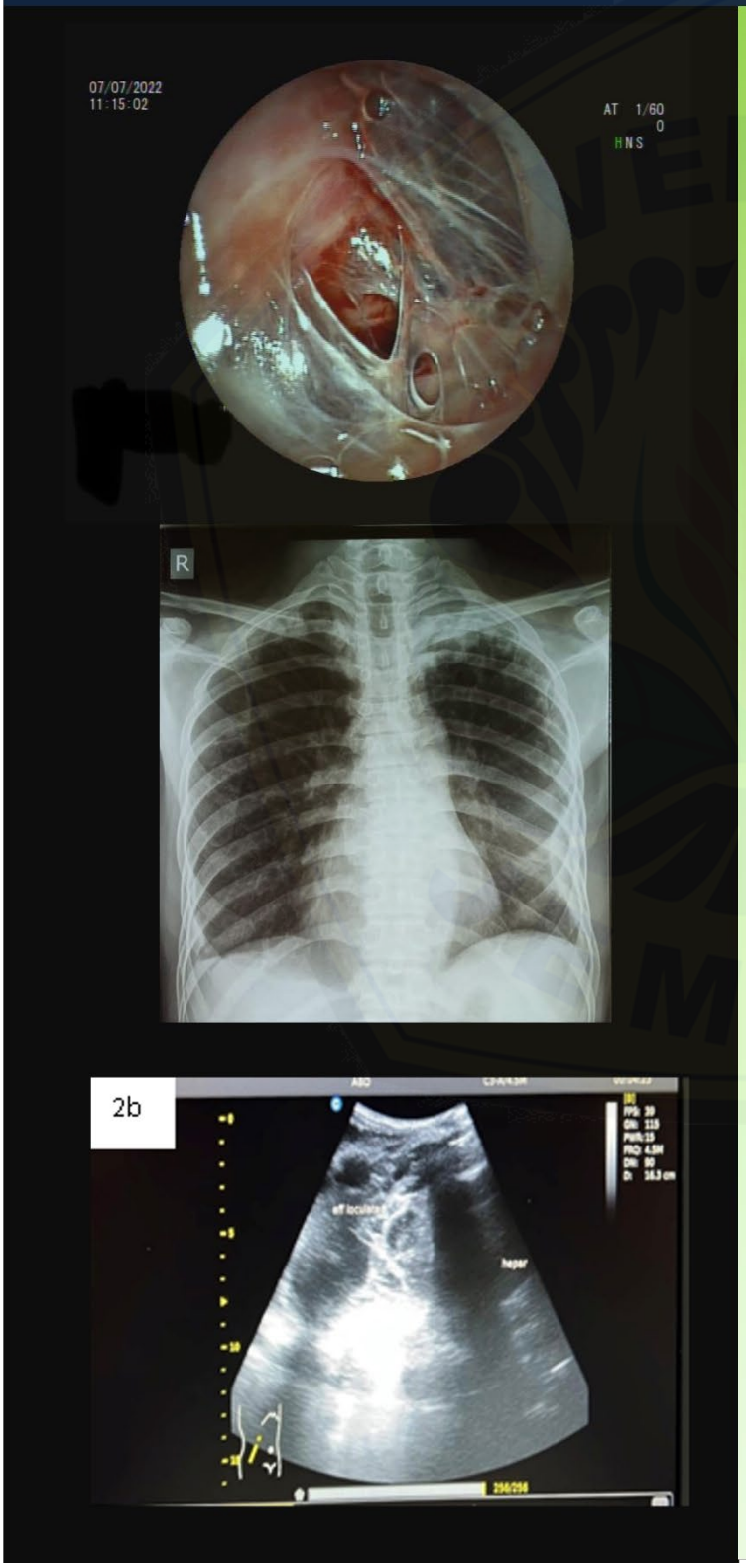

TABLE OF CONTENTS

JURNAL RESPIRASI

Vol 10 (1) 2024

Jurnal Respirasi now comes in handy:

s.id/jurnalrespirasi

INTRODUCTION

Jurnal Respirasi (JR) (p-ISSN: 2407-0831, e-ISSN: 2621-8372) was previously named Majalah Kedokteran Respirasi (MKR), which was established in 2010. The chief editor of MKR was Yusuf Wibisono, dr., Sp.P(K), FCCP. In 2015, MKR changed its name to **JR** with Winariani Koesoemoprodjo, dr., Sp.P(K), MARS, FCCP as its chief editor.

JR is a peer-reviewed national journal created by **the Department of Pulmonology and Respiratory Medicine,** Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia. **JR** is published by Universitas Airlangga, Surabaya, Indonesia. **JR** is published three times a year, every January, May, & September, and contains 9 (nine) complete texts in English. **JR** provides a forum for original articles, case reports, and literature reviews.

ACCREDITATION

JR has been accredited as a 2nd Grade Scientific Journal (**SINTA 2**) by the Ministry of Research, Technology, and Higher Education, Republic of Indonesia (RISTEKDIKTI RI) since August 2023 based on the Decree of the Director General of Research and Development Strengthening No. 79/E/KPT/2023 on 24 July 2023.

INDEXATION

Jurnal Respirasi was also accepted for indexation in **DOAJ** on 3 January 2022.

INDEXED BY:

EDITORIAL BOARD

FOCUS AND SCOPE

JR publishes various scientific works on the medical world, especially in the field of Pulmonology and Respiratory Medicine, such as:

- Acute and chronic obstructive pulmonary disease
- Air pollution and lung disease
- Allergy and immunology
- Occupational respiratory disease
- Pulmonology education
- Pulmonary infection
- Pulmonary intervention
- Pulmonary rehabilitation
- Pulmonary and respiratory health technology
- Respiratory critical care
- Sleep and respiratory medicine
- Smoking-related lung disease
- Thoracic oncology

METADATA

Metadata associated with this Archival Unit includes:

Journal URL	https://e-journal.unair.ac.id/JR
Title	Jurnal Respirasi
Publisher	Faculty of Medicine Universitas Airlangga
Description	Jurnal Respirasi (JR)
Keywords	Tuberculosis; Pneumonia; Lung Cancer; Asthma; Chronic Obstructive Pulmonary Disease (COPD); Asthma-COPD Overlap Syndrome (ACOS); Mediastinal Tumor; Pleural Effusion; Pneumothorax; Fluidopneumothorax; Chemotherapy; Radiotherapy; Superior Vena Cava Syndrome (SVCS); Cor Pulmonale; Atelectasis; Hemoptysis; Respiratory Distress; Lung Work; Pneumoconiosis; Obstructive Sleep Apnea (OSA); Lung Mycosis; Pneumocystis carinii; Middle East Respiratory Syndrome Coronavirus (MERS CoV); Severe Acute Respiratory Syndrome (SARS); Endobronchial Ultrasound Bronchoscopy Procedure (EBUS); Pleurodesis; Thoracoscopy; Thoracocentesis; Ventilator; Non-Invasive Ventilation (NIV); Public Health; Respiratory Medicine
Language(s)	English (en_US)
Publisher Email	respirasi@journal.unair.ac.id
Copyright	1. The journal allows the author to hold the copyright of the article without restrictions. 2. The journal allows the author(s) to retain publishing rights without restrictions 3. The legal formal aspect of journal publication accessibility refers to Creative Commons Attribution Share-Alike (CC BY-SA). 4. The Creative Commons Attribution Share-Alike (CC BY-SA) license allows re-distribution and re-use of a licensed work on the conditions that the creator is appropriately credited and that any derivative work is made available under “the same, similar or a

VOLUME 10 NO. 2 2024

p-ISSN 2407-0831

e-ISSN 2621-8372

TABLE OF CONTENTS

REVIEW ARTICLE

ORIGINAL ARTICLE

Comparison of Anxiety Levels in MDR-TB Patients with Individual and Short-term Regimens at Dr. Soebandi Regional General Hospital, Jember, Indonesia

Muhammad Rifqy Alvy Widodo[1], Ida Srisurani Wiji Astuti[2*], Inke Kusumastuti[3], Angga Mardro Raharjo[4], Supangat Supangat[5], Justina Evy Tyaswati[3], Noor Fadzilah binti Zulkifli[6]

[1]Faculty of Medicine, Jember University, Jember, Indonesia.
[2]Department of Public Health, Faculty of Medicine, Jember University, Jember, Indonesia.
[3]Department of Psychiatry, Faculty of Medicine, Jember University, Jember, Indonesia.
[4]Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Jember University, Jember, Indonesia.
[5]Department of Pharmacology, Jember University, Jember, Indonesia.
[6]Pathology Unit, Faculty of Medicine and Health Sciences, Islamic Science University of Malaysia, Negeri Sembilan, Malaysia.

ARTICLE INFO

Article history:
Received 12 January 2024
Received in revised form
1 April 2024
Accepted 2 May 2024
Available online 31 May 2024

Keywords:
Anxiety,
Individual,
Multidrug-resistant tuberculosis,
Short-term regimens,
Tuberculosis.

Cite this as:
Widodo MRA, Astuti ISW, Kusumastuti I, *et al*. Comparison of Anxiety Levels in MDR-TB Patients with Individual and Short-term Regimens at Dr. Soebandi Regional General Hospital, Jember, Indonesia. *J Respi* 2024; 10: 107-113.

ABSTRACT

Introduction: Multidrug-resistant tuberculosis (MDR-TB) is a form of TB that shows resistance to both isoniazid and rifampicin. Globally, the number of new MRD-TB cases has continued to rise since 2020. Indonesia is positioned among the top ten countries with the highest incidence of MDR-TB worldwide. Specifically, Jember ranked second in the number of MDR-TB cases in East Java. This study aimed to assess the comparison between the administration of individual MDR-TB regimens and short-term regimens concerning anxiety levels in MDR-TB patients at Dr. Soebandi Regional General Hospital, Jember.

Methods: This was an analytical observational study with a cross-sectional design. It was conducted at Dr. Soebandi Regional General Hospital, Jember, using interviews and medical record data from August to September 2023. The sample size was 69 participants, who were obtained through consecutive sampling. Analysis was performed using the Statistical Package for the Social Sciences (SPSS) and the Chi-Square test for group comparisons.

Results: This study found that 64% of subjects received individual regimens. In the individual regimen group, 80% of subjects reported anxiety. Among the short-term regimen group, 60% of subjects showed no anxiety. The significance value of this study was 0.007 in the Chi-Square test for group differences.

Conclusion: There was a difference in anxiety levels between individual and short-term regimens among MDR-TB patients at Dr. Soebandi Regional General Hospital, Jember. Patients with anxiety were more common in individual regimens compared to short-term regimens.

INTRODUCTION

Multidrug-resistant tuberculosis (MDR-TB) is a form of TB that shows resistance to isoniazid and rifampicin, which are the most effective anti-TB medications.[1] According to the World Health Organization (WHO), the number of MDR-TB cases in 2021 was 450,000 new cases, reflecting a 3.1% increase from 2020.[2] WHO estimated the mortality resulting from TB in 2020 and 2021 would occupy second position among all infectious diseases.[2] Indonesia ranks among the top ten countries with the highest incidence of MDR-TB.[3] In Jember, there were 193 cases of TB-MDR in 2021, making it ranked second in East Java.[4] MDR-TB can be treated with individual regimens and short-term regimens. Individual regimens are used four times more frequently than short-term regimens and have extended correlated association with treatment

*Corresponding author: rani.fk@unej.ac.id

Jurnal Respirasi (Journal of Respirology), p-ISSN: 2407-0831; e-ISSN: 2621-8372.
Accredited No. 200/M/KPT/2020; Available at https://e-journal.unair.ac.id/JR. DOI: 10.20473/jr.v10-I.2.2024.107-113

duration.[5] The particular regimen lasts longer, ranging from 18 to 20 months, than short-term regimens that last only 9 to 11 months.[1] The longer duration of MDR-TB treatment has a moderately correlated association with anxiety levels.[6] Drug side effects pose a risk of inducing anxiety, especially the side effects of cycloserine.[7] Cycloserine can traverse the blood-brain barrier, contributing to its potential for neurotoxicity, a concern that becomes significant when considering its application in treating TB meningitis.[8] The single most striking observation to emerge from the data comparison of anxiety levels between individual and short-term regimens is still limited to date. This information is crucial for implementing preventive measures and providing support for patients undergoing therapies that may cause anxiety. Further research on the comparison between individual and short-term regimens in MDR-TB patients regarding anxiety levels is necessary, given the significant impact on patients' psychological well-being and the success of their treatment. This study aimed to assess the comparison between individual and short-term regimens in MDR-TB patients concerning anxiety levels at Dr. Soebandi Regional General Hospital, Jember.

METHODS

This was an analytical observational study with a cross-sectional design conducted at Dr. Soebandi Regional General Hospital, Jember, from August to September 2023, using Hamilton Anxiety Rating Scale (HARS) questionnaire interviews and patients' medical records. HARS is a measurement instrument used in the field of psychiatry to evaluate a person's level of anxiety. This scale was originally developed by Dr. Max Hamilton in 1959 and has become one of the most commonly used instruments in research and clinical practice. HARS consists of a series of questions and statements designed to assess various anxiety symptoms experienced by individuals. This scale includes symptoms such as restlessness, tension, fear, sleep disturbances, physical symptoms related to anxiety, and other cognitive and emotional symptoms. For each question or statement, respondents are asked to provide the severity of the symptoms they experience, with a rating scale ranging from 0 to 4. The ratings are then used to calculate the total anxiety score, which is divided into five levels, no anxiety (<14), mild anxiety (14-20), moderate anxiety (21-27), severe anxiety (28-41), and very severe anxiety (>41). A higher score indicates a higher level of anxiety. The exclusion criteria for this study were MDR-TB patients with complications in the heart, liver, kidneys, and musculoskeletal system who discontinued the use of cycloserine and had a history of psychiatric consultation due to anxiety disorders before being diagnosed with MDR-TB. The total sample size for this study was 69 patients obtained through consecutive sampling. The independent variable in this study was the type of regimen administered to MDR-TB patients at Dr. Soebandi Regional General Hospital, Jember. The dependent variable was the anxiety level of MDR-TB patients at Dr. Soebandi Regional General Hospital, Jember. The instruments used in this study included a sample explanation sheet, informed consent form, HARS, and patients' medical records.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) with the Chi-Square test for group differences. The Ethics Commission of the Faculty of Medicine, Jember University, granted ethical clearance for this study, with letter number 1824/H25.1.11/KE/2023.

RESULTS

The study sample comprised 38 male patients (55.1%) and 31 female patients (44.0%). The age range was 26-45 years old (45.7%), 18-25 years old (21.4%), and 46-65 years old (32.9%). The highest education level among MDR-TB patients in this study was in primary and junior high school (31.9%). The higher education level (college graduates) was only 7.2%, and the remaining 29% had a senior high school education level. The results for each sample characteristic can be seen in Table 1.

Table 1. Sample Characteristics

Variable	Frequency (N=69)	Percentage (%)
Gender		
Male	38	55.1
Female	31	44.9
Age (years old)		
18-25	12	17.4
26-45	34	49.3
46-65	23	33.3
Education		
Elementary school	22	31.9
Junior high school	22	31.9
Senior high school	20	29.0
College	5	7.2
MDR-TB Regimen		
STR	25	36.2
Individual	44	63.8
Anxiety Level		
No anxiety	29	42.0
Mild	17	24.6
Medium	10	14.5
Severe	13	18.8

This study used the type of MDR-TB regimen obtained from patients' medical records as the independent variable. The data showed that 25 samples (36.2%) consumed short-term MDR-TB regimens, and 44 (64.3%) had individual regimens. The anxiety level was measured using the HARS questionnaire. There were 40 samples (58%) of patients experiencing anxiety, while the number of non-anxious patients totaled 29 samples (42%). Among the anxious patients, 24.6% had mild anxiety, 14.5% had moderate anxiety, and 18.8% had severe anxiety. The significance value obtained from the Chi-Square test between the variables of MDR-TB regimen types and anxiety levels was 0.007, indicating significance. The interpretation of this study revealed differences in anxiety levels among MDR-TB patients with different kinds of MDR-TB regimens. The results of the measurements for both variables can be seen in Table 2.

Table 2. Distribution of Anxiety Level with Regimen MDR-TB

	Anxiety Level			
	No Anxiety	Mild Anxiety	Moderate Anxiety	Severe Anxiety
Treatment Regimen				
Short-Term	15	5	2	3
Individual	9	11	13	11

Based on the HARS questionnaire, 14 specific symptoms were observed. A score of 0 indicated no symptoms, and a higher score indicated increased intensity or worsening of symptoms. Insomnia is the most severe symptom, with the maximum percentage scores (5 points) being 12% for those receiving a short-term regimen and 20% for those receiving individual regimens, respectively. Genitourinary symptoms were uncommonly experienced, scoring 0 points for both short-term (64%) and individual regimens (43%). Symptoms of anxiety and depression were predominantly observed in the individual regimen group (13%).

Most patients, regardless of regimen type, had a score of 2 on feelings of anxiety. Tension was mostly scored 0 in the short-term regimen and 1 in the individual regimen. Fear scored mostly 0 in the short-term regimen and 3 in the individual regimen. Insomnia was primarily scored 1 in the short-term regimen and 3 in the individual regimen. Intellectuality scored mostly 0 in the short-term regimen and 2 or 3 in the individual regimen. Feelings of depression were mostly scored 1 in both regimens. Somatic (muscle) symptoms were mostly scored 0 in the short-term regimen and 1 in the individual regimen. Somatic (sensory) symptoms scored 0 in both regimens. Cardiovascular symptoms were equally scored 0 and 1 in the short-term regimen and mostly scored 2 in the individual regimen. Respiratory symptoms were scored 1 in the short-term regimen and 3 in the individual regimen. Gastrointestinal symptoms mainly scored 0 in both regimens. Genitourinary symptoms scored 0 in the short-term regimen and 0 or 1 in the individual regimen. Autonomic symptoms scored 0 in the short-term regimen and 0 or 2 in the individual regimen. Behavior was mostly scored 0 in both regimens. The results of the anxiety symptoms from the HARS can be seen in Table 3.

Table 3. Anxiety Symptoms based on the HARS

No.	Question	Score	Type of Regimen	
			Short-Term Regimen N = 25 (%)	Individual Regimen N = 44 (%)
1.	Feelings of anxiety	Not present	24	7
		Mild	4	25
		Moderate	48	32
		Severe	20	25
		Very severe	4	11
2.	Tension	Not present	52	25
		Mild	28	34
		Moderate	16	30
		Severe	4	11
		Very severe	0	0
3.	Fear	Not present	32	7
		Mild	28	25
		Moderate	20	25
		Severe	16	41
		Very severe	4	2
4.	Insomnia	Not present	20	7
		Mild	28	23
		Moderate	20	7
		Severe	20	43
		Very severe	12	20

No.	Question	Score	Type of Regimen	
			Short-Term Regimen N = 25 (%)	Individual Regimen N = 44 (%)
5.	Intellectuality	Not present	64	32
		Mild	16	32
		Moderate	16	18
		Severe	4	16
		Very severe	0	2
6.	Feelings of depression	Not present	28	20
		Mild	36	32
		Moderate	24	30
		Severe	12	16
		Very severe	0	2
7.	Somatic (muscle) symptoms	Not present	52	30
		Mild	28	36
		Moderate	12	23
		Severe	8	11
		Very severe	0	30
8.	Somatic (sensory) symptoms	Not present	52	39
		Mild	28	34
		Moderate	12	9
		Severe	8	14
		Very severe	0	5
9.	Cardiovascular symptoms	Not present	32	18
		Mild	32	23
		Moderate	20	27
		Severe	8	20
		Very severe	8	11
10.	Respiratory symptoms	Not present	16	14
		Mild	28	16
		Moderate	24	20
		Severe	20	30
		Very severe	12	20
11.	Gastrointestinal symptoms	Not present	60	41
		Mild	20	20
		Moderate	16	32
		Severe	4	2
		Very severe	0	5
12.	Genitourinary symptoms	Not present	64	43
		Mild	20	43
		Moderate	12	7
		Severe	4	2
		Very severe	0	5
13.	Autonomic symptoms	Not present	44	30
		Mild	28	25
		Moderate	24	30
		Severe	4	11
		Very severe	0	5
14.	Behavior	Not present	60	43
		Mild	32	34
		Moderate	8	14
		Severe	0	5
		Very severe	0	5

The significance value obtained from the Chi-Square test between the variables of MDR-TB regimen types and anxiety levels was 0.007, indicating significance. The findings of this study revealed differences in anxiety levels among MDR-TB patients with different kinds of MDR-TB regimens.

DISCUSSION

MDR-TB patients mostly were males (53.6%) and outnumbered females (46.4%). This study is consistent with the study by Shivekar, *et al.* (2020), indicating that males are more susceptible to MDR-TB due to the risk of exposure in the workplace and public environments.[9] Most of the age group fell within the productive age range of 26-45 years old (49.3%). The high social interaction and mobility facilitate the transmission of this disease to other individuals and the surrounding environment.[10] The productive age group plays a significant role in the spread of MDR-TB as the stigma surrounding MDR-TB may hinder the economic activities of patients, leading to a delay in seeking

treatment.[11] These results align with the study by Imam, *et al*. (2023), which stated that individuals in the productive age group are highly vulnerable to MDR-TB due to increased social interaction and mobility.[12] Most of the samples in this study have completed primary and junior high school education. These findings are similar to the previous study, indicating that higher levels of education, such as high school and college, contributed to a better understanding of the dangers of pulmonary TB.[13]

Knowledge plays a crucial role for individuals with pulmonary TB, as being aware and understanding the treatment of pulmonary TB, along with its side effects and risks, enables patients to adhere to the treatment regimen consistently. It aligns with the findings of a literature review indicating that one of the causes of the emergence of MDR-TB is non-compliance with treatment.[14] Consequently, individuals with higher education levels are more likely to adhere to treatment to achieve recovery.[13] The majority of the regimens obtained in this study sample were individual regimens, totaling 44 samples (63.8%). It aligns with a study conducted in Jakarta, Indonesia, which stated that individual regimens are four times more commonly used because patients seek treatment when their condition is already severe and does not meet the criteria for short-term regimen administration.[5] In terms of anxiety levels in this study, based on the categorization of each anxiety level, the majority experienced anxiety for both regimens, with a percentage of 58%. This corresponds with a study indicating that the results of a systematic review of 15 journal articles showed that nearly all MDR-TB patients experienced anxiety and even depression.[1]

Patients who meet the criteria of shorter regimen therapy will receive a shorter regimen treatment without injections that cannot be modified, with seven types of initial-stage drugs (bedaquiline, moxifloxacin, ethionamide, clofazimine, pyrazinamide, high-dose isoniazid, and ethambutol) for the first 4-6 months, and four types of advanced stage drugs (moxifloxacin, clofazimine, pyrazinamide, and ethambutol) for the last five months.[15] For patients on a long regimen for MDR-TB, five TB agents should be included at the beginning based on the class of medication, and at least three should remain after discontinuing bedaquiline. The doctor should include levofloxacin or moxifloxacin, bedaquiline, clofazimine, cycloserine, and linezolid in an MDR-TB individual regimen.

Another important finding was that the most noticeable symptom of anxiety in respondents receiving either short-term or individual regimens, with a significant percentage in the individual regimen, was insomnia. MDR-TB patients are at a higher risk of experiencing insomnia due to the side effects of drugs such as bedaquiline, cycloserine, and levofloxacin.[16] It aligns with a study in India stating that cycloserine in the central nervous system (CNS) can affect gamma-aminobutyric acid (GABA) and induce a fight-or-flight response.[17] Genitourinary symptoms are uncommonly experienced by patients undergoing short-term regimens due to the absence of drug side effects from short-term regimens that trigger genitourinary disturbances.[18] Symptoms of anxiety and depression are predominantly observed in the individual regimen group with higher percentages and scores. This is because the individual regimen includes cycloserine, which has side effects on the CNS, leading to neuropsychiatric disturbances.[19]

Cycloserine can induce neurotoxicity because it can cross the blood-brain barrier. It is also used in the treatment of TB meningitis. Cycloserine is the MDR-TB drug with the highest concentration in the cerebrospinal fluid (CSF).[8] Cycloserine, which has a high concentration in the CSF, is also an inhibitor in the production of GABA.[19] A systematic review conducted previously concluded that psychological complaints among MDR-TB patients receiving cycloserine therapy included hallucinations, depression, anxiety disorders, behavioral disturbances, euphoria, and suicidal tendencies.[20] The study revealed that patients on a mandatory cycloserine regimen, which in this case was an individual regimen, had temporary discontinuation of cycloserine for 8 out of 13 patients with general anxiety and depression disorders.[21] The high level of anxiety in patients undergoing individual regimen treatment with longer duration aligns with a study in China, which concluded that the longer patients undergo treatment, the greater the stressors that arise.[22] This result is further supported by a study stating that one of the contributing factors to MDR-TB anxiety is the length of treatment.[7]

The anxiety levels in the majority of subjects with the individual regimen were found among 40 subjects (58%). MDR-TB patients undergoing individual regimens are more likely to experience anxiety due to the long (20 months) and intense treatment.[23] Individual regimens consist of potent anti-TB drugs with severe side effects, higher case fatality rates, and lower cure rates.[22] Additionally, a qualitative study in Thailand revealed that 5 out of 12 MDR-TB patients undergoing individual treatment experienced anxiety.[24] The majority of anxiety levels in the short-term regimen samples in this study indicated no anxiety (60%). This aligns with a study in Nepal, suggesting that short-term regimen patients tend to experience less anxiety. In general, it is likely because MDR-TB patients receiving short-term regimens have a shorter duration of treatment compared to those on individual regimens.[7]

The results of the data analysis using the Chi-Square test showed a significant outcome with a two-sided Asymp. Sig. value of 0.007. This means there was a difference in anxiety levels between individual and short-term regimens in MDR-TB patients at Dr. Soebandi Regional General Hospital, Jember. This is similar to a study in China, indicating that MDR-TB patients on individual regimens are more likely to experience anxiety due to the long and intense treatment consisting of potent anti-TB drugs with psychiatric side effects.[22] Furthermore, these results are supported by a study by Susanto, *et al*. (2023), which showed a high prevalence of anxiety among MDR-TB patients in Indonesia, especially in individual regimens, with proportions reaching up to 68.6%.[25]

The difference in anxiety levels between individual and short-term regimens can be attributed to variations in drug groups and treatment durations.[26] Long-term regimens contain the mandatory drug cycloserine, leading to the expectation of a more extended treatment duration compared to short-term regimens. TB patients who are undergoing initial treatment will experience severe anxiety due to the new habits of TB sufferers.[27] Patients who have passed the adjustment of new habits will experience an increase in anxiety again due to the length of treatment, which makes patients feel bored and unable to complete the treatment.[18] A study conducted at Dr. Kariadi General Hospital, Semarang, divided the duration of TB treatment into three groups, showing that the group of more than six months had a high level of anxiety, while the 3-6 months group had relatively low anxiety.[28]

The heightened anxiety in samples receiving treatment with an individual regimen is consistent with a study in India.[23] Furthermore, a study in Cameroon also supports these findings, indicating a high treatment completion rate of 89% among patients who completed the short-term regimen.[29] Anxiety was identified as one of the contributing factors to treatment success, and patients frequently discontinued treatment because of anxiety.[30] The different treatment durations also lead to differences in the anxiety levels between the two types of MDR-TB regimens. The individual regimen requires a more extended treatment duration, ranging from 18 to 20 months, compared to the short-term regimen (9 to 11 months).[1] The high level of anxiety in individual regimen treatment, which has a longer duration, is consistent with the findings in China, which concluded that the longer the treatment duration, the greater the stressors experienced by the patients.[31] It is further supported by a study in Nepal, stating that one of the factors causing anxiety in MDR-TB is the prolonged treatment duration.[7]

CONCLUSION

This study indicated that MDR-TB patients at Dr. Soebandi Regional General Hospital, Jember, more frequently received individual regimens. Furthermore, the results showed a difference in anxiety levels between individual and short-term regimens in MDR-TB patients, where respondents who underwent individual MDR-TB regimens had higher anxiety levels. A shorter drug regimen and lower side effects are needed to increase the tolerability and obedience of patients to treatment, aiming to increase the success rate of treatment for MDR-TB, reduce anxiety levels, and ultimately help the government increase the success rate of MDR-TB treatment.

Acknowledgments
We would like to thank everyone who provided guidance and contributed to the preparation of this study.

Conflict of Interest
The authors declared there is no conflict of interest.

Funding
This study did not receive any funding.

Authors' Contributions
Conceptualization of ideas: MRAW, ISWA, IK, AMR, SS, JET, NFBZ. Methodology: MRAW, ISWA, IK, AMR, SS, JET, NFBZ. First draft: MRAW, ISWA, IK, AMR, SS, JET, NFBZ. Editing: MRAW, ISWA, IK, AMR, SS, JET, NFBZ. Referencing: MRAW, ISWA, IK, AMR. Proofreading: MRAW, ISWA, IK, AMR, SS, NFBZ.

REFERENCES

1. Jang JG, Chung JH. Diagnosis and Treatment of Multidrug-Resistant Tuberculosis. *Yeongnam Univ J Med* 2020; 4: 277–285.
2. (WHO) WHO. *WHO Consolidated Guidelines on Tuberculosis: Module 4: Treatment: Drug-Susceptible Tuberculosis Treatment*. Geneva, https://www.who.int/publications/i/item/9789240048126 (2022).
3. World Health Organization (WHO). *Global Tuberculosis Report 2022*. Geneva, https://www.who.int/teams/global-tuberculosis-programme/tb-reports/global-tuberculosis-report-2022 (2022).
4. Timur BPSPJ. *Jumlah Kasus Penyakit Menurut Kabupaten/Kota dan Jenis Penyakit di Provinsi Jawa Timur, 2021*. Surabaya, https://jatim.bps.go.id/statictable/2022/11/02/2389/jumlah-kasus-penyakit-menurut-kabupaten-kota-dan-jenis-penyakit-di-provinsi-jawa-timur-2021.html (2022).

5. Wibowo A, Burhan E, Putra AC. Pola Resistansi Kuman Tuberkulosis dan Regimen Pengobatan pada Pasien Tuberkulosis Resisten Obat di Rumah Sakit Pusat Rujukan Respirasi Nasional Persahabatan Jakarta. *J Kedokt Univ Lampung* 2021; 5: 1–6.
6. Husna CH Al. Hubungan Lama Menjalani Hemodialisis dengan Kecemasan Pasien. *Indones J Nurs Heal* 2021; 6: 31–38.
7. Walker IF, Kanal S, Baral SC, *et al*. Depression and Anxiety in Patients with Multidrug-Resistant Tuberculosis in Nepal: An Observational Study. *Public Heal Action* 2019; 9: 42–48.
8. Kempker RR, Smith AGC, Avaliani T, *et al*. Cycloserine and Linezolid for Tuberculosis Meningitis: Pharmacokinetic Evidence of Potential Usefulness. *Clin Infect Dis* 2022; 75: 682–689.
9. Shivekar SS, Kaliaperumal V, Brammacharry U, *et al*. Prevalence and Factors Associated with Multidrug-Resistant Tuberculosis in South India. *Sci Rep* 2020; 10: 17552.
10. Saifullah A, Mallhi TH, Khan YH, *et al*. Evaluation of Risk Factors Associated with the Development of MDR- and XDR-TB in a Tertiary Care Hospital: A Retrospective Cohort Study. *PeerJ* 2021; 9: e10826.
11. Cheng Q, Xie L, Wang L, *et al*. Incidence Density and Predictors of Multidrug-Resistant Tuberculosis Among Individuals with Previous Tuberculosis History: A 15-Year Retrospective Cohort Study. *Front Public Heal*; 9, https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2021.644347 (2021).
12. Imam FRS, Umboh JML, Tuda JSB. Faktor-Faktor Risiko yang Berhubungan dengan Kejadian Multidrug-Resistant Tuberculosis (TB-MDR) di Kota Ternate, Maluku Utara. *e-CliniC* 2023; 11: 260–268.
13. Juliati L, Makhfudli M, Wahyudi AS. Analysis Factors Influence Compliance Behavior of Drug Prevention and Drug Compliance on Tuberculosis Patient Based on Health Belief Model. *Indones J Community Heal Nurs* 2020; 5: 62–71.
14. Bawonte TG, Mambo CD, Masengi ASR. Faktor-Faktor Yang Mempengaruhi Tuberculosis Multidrug Resistance (TB MDR). *eBiomedik* 2021; 9: 117–125.
15. Nunn AJ, Phillips PPJ, Meredith SK, *et al*. A Trial of a Shorter Regimen for Rifampin-Resistant Tuberculosis. *N Engl J Med* 2019; 380: 1201–1213.
16. Espinosa-Pereiro J, Sánchez-Montalvá A, Aznar ML, et al. MDR Tuberculosis Treatment. *Medicina (Kaunas)*; 58. Epub ahead of print January 2022.
17. Yadav S. Cycloserine-Induced Insomnia and Psychosis in Multidrug-Resistant Pulmonary Tuberculosis - A Case Report. *Cureus* 2022; 14: e32963.
18. Farida F. Faktor Keberhasilan Pengobatan Multi Drug Resistance Tuberculosa (MDR-TB) di Indonesia : Tinjauan Sistematik. *J Heal Epidemiol Commun Dis*; 6. Epub ahead of print 12 November 2020.
19. Otu A, Offor JB, Ekpor IA, *et al*. New-Onset Psychosis in a Multi-Drug Resistant Tuberculosis Patient on Cycloserine in Calabar, Nigeria: A Case Report. *Trop J Pharm Res* 2014; 13: 303.
20. Duko B, Bedaso A, Ayano G. The Prevalence of Depression among Patients with Tuberculosis: A Systematic Review and Meta-Analysis. *Ann Gen Psychiatry* 2020; 19: 30.
21. Laxmeshwar C, Das M, Mathur T, *et al*. Psychiatric Comorbidities among Patients with Complex Drug-Resistant Tuberculosis in Mumbai, India. *PLoS One* 2022; 17: e0263759.
22. Liu K, Zhang Y, Qu S, *et al*. Prevalence and Correlates of Anxiety and Depressive Symptoms in Patients with and without Multi-Drug Resistant Pulmonary Tuberculosis in China. *Front Psychiatry* 2021; 12: 674891.
23. Srinivasan G, Chaturvedi D, Verma D, *et al*. Prevalence of Depression and Anxiety among Drug Resistant Tuberculosis: A Study in North India. *Indian J Tuberc* 2021; 68: 457–463.
24. Numpong S, Kengganpanich M, Kaewkungwal J, *et al*. Confronting and Coping with Multidrug-Resistant Tuberculosis: Life Experiences in Thailand. *Qual Health Res* 2021; 32: 159–167.
25. Susanto TD, Widysanto A, Cipta DA, *et al*. Anxiety and Depression Level of Patients with Multidrug-Resistant Tuberculosis (MDR-TB) in Two Hospitals in Banten Province, Indonesia. *Dialogues Heal* 2023; 2: 100115.
26. Nahid P, Mase SR, Migliori GB, *et al*. Treatment of Drug-Resistant Tuberculosis. An Official ATS/CDC/ERS/IDSA Clinical Practice Guideline. *Am J Respir Crit Care Med* 2019; 200: e93–e142.
27. Simanjuntak M, Efendy I, Yuniati Y, *et al*. Factors Affecting the Behavior of Lung-Tb Patients in Preventing Transmission. *J Community Heal Provis* 2022; 2: 105–115.
28. Azam M, Fibriana A, Indrawati F, *et al*. Prevalence and Determinant of Depression among Multi-Drug Resistance Tuberculosis: Study in Dr. Kariadi General Hospital. *J Respirologi Indones* 2020; 40: 88–96.
29. Anye LC, Agbortabot Bissong ME, Njundah AL, *et al*. Depression, Anxiety and Medication Adherence among Tuberculosis Patients Attending Treatment Centres in Fako Division, Cameroon: Cross-Sectional Study. *BJPsych Open* 2023; 9: e65.
30. Soedarsono S. Tuberculosis: Development of New Drugs and Treatment Regimens. *J Respirasi* 2021; 7: 36–45.
31. Liu Y, Sun Y, Zhang X, *et al*. Evaluation of the Frequency of Mutation Genes in Multidrug-Resistant Tuberculosis (MDR-TB) Strains in Beijing, China. *Epidemiol Infect* 2021; 149: e21.