

# Determinants of Loss to Follow-Up Among MDR-TB Patients

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## Abstract

Cases of tuberculosis has gotten worse since results of global surveillance revealed that *mycobacterium* is resistant to rifampicin and isoniazid. It can cause Loss to Follow-Up among MDR-TB patients. The purpose of this study is Determinants of Loss to Follow-Up among MDR-TB Patients. This research is an analytic observational study with a case control study design with a retrospective approach. Cases were MDR-TB patients who dropped out of treatment as much 27 people, while controls were subjects with MDR-TB patients who did not Loss to Follow-Up of treatment as much 83 people. Data analysis was performed by looking at the Odds Ratio value. The result showed that knowledge (OR = 5.28, 95% CI = 1.410347–29.19908), drug side effect (OR = 32.324332, 95% CI = 4.732715–1353.07), family support (OR = 5.01875, 95% CI = 1.602489 – 15.57846), social stigma (OR = 6.712963, 95% CI = 1.473798–61.68985) were the determinants of loss to follow up among MDR-TB patients. It can conclude that determinants of loss to follow-up among MDR-TB patients include knowledge, drug side effects, family support, and social stigma.

**Keywords:** Tuberculosis, loss to follow-up MDR-TB, knowledge, drug side effects, family support, social stigma

## Introduction

The problem of tuberculosis has gotten worse since results of global surveillance revealed that *mycobacterium* is resistant to rifampicin and isoniazid, with or without other first-line anti-tuberculosis drugs. Rifampicin and isoniazid are the strongest anti-tuberculosis drugs<sup>1</sup>. Those two most powerful anti-TB drugs requiring treatment with a second-line regimen. MDR-TB also requires treatment with second-line drugs<sup>2</sup>

Globally, 160,684 cases of multidrug-resistant tuberculosis and rifampicin-resistant TB (MDR/RR-TB) were reported in 2017 (up from 153,119 in 2016), and 139,114 cases were registered on treatment (up from

129,689 in 2016). Eight of the 30 countries with a high burden of MDR-TB had treatment success rates of at least 75% in their 2017 patient cohort. However, India and Indonesia had treatment success rates below 50%, partly due to high mortality and rate of Loss to Follow-Up (18% and 26% in Indonesia, 18% and 19% in India, respectively). Rate of Loss to Follow-Up among MDR-TB patients was highest in the Philippines and China (33% and 29%, respectively), and outcome data were missing for the majority of patients in Somalia and Zimbabwe (15% and 17%, respectively)<sup>3</sup>

Indonesia is ranked 8<sup>th</sup> out of 27 countries with the burden of MDR-TB with an estimated 6,800 new MDR-TB patients each year<sup>4</sup>. From the MDR-TB rate, it is estimated that 2% were from new TB cases and 12% were from re-treatment TB cases. There are 55% of MDR-TB patients who have not been diagnosed or treated properly. National MDR-TB case data in 2015 found 18 thousand MDR-TB cases, including 15,300

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suspected, 1,860 confirmed, and 1,566 MDR-TB cases undergoing treatment<sup>5</sup>

Loss to Follow-Up among MDR-TB patients is a problem of individuals and communities since it can lead to increased transmission, resistance, and death. The rate of Loss to Follow-Up among drug-resistant tuberculosis (DR-TB) patients increases every year in Indonesia. The high rate of Loss to Follow-Up among DR-TB patients are because 24% of patients have not been tracked; 26% of patients experienced drug side effects; 21% of patients were unknown; 13% of patients were not found; 6% of patients did not believe the treatment; 7% was due to socioeconomic factors; and 3% was due to other factors<sup>6</sup>

Data from the South Sulawesi Provincial Health Office 2019 shows that the rate of Loss to Follow-Up among DR-TB patients was 20.8% in 2016, 24.5% in 2017 and 37.3% in 2018. It indicates that the rate of Loss to Follow-Up among DR-TB patients increases every year<sup>7</sup>. Data from Labuang Baji Hospital shows that there were 14 out of 55 MDR-TB patients who dropped out in 2018, and 13 out of 45 MDR-TB patients who dropped out in 2019<sup>8</sup>

Moreover, some patients who experience side effects from anti-TB drugs also decide to stop treatment. It eventually causes multiple TB germs immunity to anti-TB drugs (multidrug resistance) and will lead to a TB epidemic that is difficult to manage<sup>9</sup>. Numerous side effects and long duration of treatment affect the treatment success rate in MDR-TB patients. According to WHO,

the cure rate in persons with MDR-TB worldwide is < 60%.

Drug-resistant TB threatens global TB care and prevention, and it remains a major public health problem in many countries. Based on the aforementioned events and data, the researcher is interested in conducting a research on the Determinants of Loss to Follow-Up among MDR-TB Patients.

### Material and Method

This research is an analytic observational study with a case control study design with a retrospective approach. Cases were subjects with positive effect characteristics, which in this study were MDR-TB patients who dropped out of treatment, while controls were subjects with negative effect characteristics, namely MDR-TB patients who did not Loss to Follow-Up of treatment. Both groups were traced back to determine the presence of risk factor exposure to effects.

This study was conducted at Labuang Baji Hospital, Makassar. Labuang Baji Hospital is a referral center for MDR-TB examination in South Sulawesi, while the number of MDR-TB patients in 2018 - 2019 reached 110 MDR-TB cases in Makassar. Sampling was carried out using total sampling. The ratio of the number of cases and controls used was 1: 3, by which the number of case respondents was 27 people and the number of control respondents was 83 people. Data analysis was performed by looking at the Odds Ratio value.

### Findings

**Table 1 The Risk of Knowledge on The Incident of Loss to Follow-Up Among MDR-TB Patients**

Knowledge	Patients				Total		OR	CI
	Case		Control		N	%		
	n	%	n	%				
High Risk	24	88.89	50	60.24	74	67.27	5.28	1.41034– 29.19908
Low Risk	3	11.11	33	39.76	36	32.73		
Total	27	100.00	83	100.00	110	100.00		

Table 1 shows that patients with  $\leq 3$  correct answers had 5.28 times risk of dropping out compared to patients with  $> 3$  correct answers. The value of the Confidence Interval (1.410347 – 29.19908) does not include value of 1, meaning that the risk was significant.

**Table 2 The Risk of Drug Side Effect on The Incident of Loss to Follow-Up Among MDR-TB Patients**

Drug Side Effect	Patients				Total		OR	CI
	Case		Control					
	n	%	n	%	N	%		
High Risk	26	96.30	37	44.58	63	57.27	32.324332	4.73271 – 1353.07
Low Risk	1	370	46	55.42	47	42.73		
Total	27	100.00	83	100.00	110	100.00		

Table 2 shows that MDR-TB patients who experienced severe drug side effects such as liver dysfunction, kidney function disorders, gastrointestinal bleeding, severe electrolyte disturbances, hearing loss, vision problems, seizures, tendinitis and hypothyroidism were 32.324332 times more likely to Loss to Follow-Up than those who experienced mild drug side effects such as

mild skin reactions, allergic skin reactions with/without fever, severe/mild nausea and vomiting, anorexia, diarrhea, headache, vertigo, sleep disturbances, minor electrolyte disturbances, depression, behavior changes, gastritis and pain at the injection site. The value of the Confidence Interval (4.732715 – 1353.07) does not include value of 1, meaning that the risk was significant.

**Table 3 The Risk of Family Support on The Incident of Loss to Follow-Up Among MDR-TB Patients**

Family Support	Patients				Total		OR	CI
	Case		Case					
	n	%	n	%	N	%		
High Risk	11	40.74	10	12.05	21	19.09	5.01875	1.602489– 15.57846
Low Risk	16	59.26	73	87.95	89	80.91		
Total	27	100.00	83	100.00	110	100.00		

Table 3 shows that MDR-TB patients who rarely or never received family support such as reminding and ensuring that they take their medication regularly and taking them to health care facilities for treatment

had 5.01875 times risk of dropping out than those who always received family support. The value of the Confidence Interval (1.602489 – 15.57846) does not include value of 1, meaning that the risk was significant.

**Table 4 The Risk of Social Stigma on The Incident of Loss to Follow-Up Among MDR-TB Patients**

Social Stigma	Patients				Total		OR	CI
	Case		Control					
	n	%	n	%	N	%		
High Risk	25	92.59	54	65.06	79	71.82	6.712963	1.473798– 61.68985
Low Risk	2	7.41	29	34.94	31	28.18		
Total	27	100.00	83	100.00	110	100.00		

Table 4 shows that MDR-TB patients who felt ashamed and felt isolated in society because they had MDR-TB disease had 6.712963 times risk of dropping out than those who did not. The value of the Confidence Interval (1.473798 – 61.68985) does not include value of 1, meaning that the risk was significant.

### Discussions

The results of this study indicated that MDR-TB patients with low level of knowledge had 5.28 times risk of dropping out. It is in line with a study conducted by Supardi et al. finding that low level of knowledge of MDR-TB had 1.723 times risk of conversion change (95% CI=0.777-3.821)<sup>10</sup>

It is important for MDR-TB patients to know and understand well the knowledge of MDR-TB definition, causes, duration of treatment, prevention, the importance of taking MDR-TB drugs regularly, the consequences of Loss to Follow-Up, and the importance of sputum and photorontgen examinations. In fact, mastery of knowledge about MDR-TB greatly influences patient adherence behavior in treatment.

A good level of knowledge will certainly make it easier for sufferers to undergo MDR-TB treatment<sup>11</sup>. Many patients have low level of knowledge of MDR-TB which affect their own treatment. Patients who Loss to Follow-Up may be because they feel that they have recovered from their illness, but they do not know the impact of dropping out during the treatment period.

Moreover, the results of this study indicate that MDR-TB patients who experienced severe drug side

effects of the drug had 32.324332 times risk of dropping out than those who experienced mild drug side effects, which was statistically significant. (95% CI=4.732715–1353.07). It supports a study conducted by Wohlleben et al. which found that MDR-TB patients who experienced treatment side effects were 3.67 times risk of dropping out<sup>12</sup>.

MDR-TB treatment has different and more severe side effects than TB treatment since the drug for MDR-TB patients has a higher dose<sup>13</sup>. Drug side effects can be controlled in various ways, especially mild side effects. This study showed that the most widely used method for the case group to control drug side effects was by consulting with health workers with a percentage of 55.56%, while the remaining 18.52% controlled drug side effects by stopping taking anti-tuberculosis drugs.

However, because MDR-TB patients experience drug side effects for a long duration, they often Loss to Follow-Up unilaterally, with a percentage of 100.00%, without prior confirmation with health workers. Drug side effects can be overcome by providing information on how to deal with them, so that MDR-TB patients know in advance about the side effects and are not worried about them while ingesting the drug. Minor side effects of drugs can actually be managed so that sufferers can continue taking medication without dropping out<sup>11</sup>

Besides, the results of this study also demonstrate that MDR-TB patients who rarely or never received family support such as reminding and ensuring that they take their medication regularly and taking them to health care facilities for treatment had 5.01875 times risk of dropping out than those who always received family

support.

Support provided for family members who are sick can be in the form of meeting their food and drinking needs and covering costs for medical treatment. If there is a problem faced by the patient, it is necessary for the family to provide advice for problem solving<sup>14</sup>. Family support is needed by MDR-TB patients as the main support system so that they can develop an effective coping response to adapt well in dealing with stressors they face related to their illness in terms of physical, psychological, and social.

Patients without strong family and social support are more prone to Loss to Follow-Up<sup>15</sup>. There are four forms of family support that can be applied to MDR-TB patients including instrumental, informational, emotional, and reward supports. These forms of support can keep MDR-TB patients excited about treatment and not think or act on dropping out<sup>16</sup>. More attention is needed to increase awareness of TB transmission, especially among family members of MDR-TB patients and the community as a whole<sup>17</sup>.

In addition, the results also showed that MDR-TB patients who felt ashamed and felt isolated in society because they had MDR-TB disease had 6.712963 times risk of dropping out than those who did not. An obvious cause of social stigma and discrimination from the community is the fear of being infected with MDR-TB disease. It is in accordance with a study by Stosic et al which confirmed that MDR-TB cases are 3.32 times more likely to experience the social stigma associated with TB<sup>18</sup>.

Social stigma results in acts of discrimination; the act of not recognizing or not making efforts to fulfill the basic rights of an individual or group as a dignified human being<sup>19</sup>. People still think that TB is a witchcraft, curse, and hereditary disease. The existence of this negative view/stigma causes sufferers to be embarrassed and reluctant to go to health services<sup>20</sup>.

An obvious cause of social stigma and discrimination from the community is the fear of being infected with MDR-TB disease. Unfortunately, patients also often isolate themselves to avoid infecting others and uncomfortable situations such as being shunned by people around them or being the talk of others.

The social stigma of MDR-TB patients makes it more difficult for patients to continue treatment because their fears of being identified. In other words, being infected with MDR-TB hinders their access to health services every day which can lead to serious symptoms and increased transmission. MDR-TB patients feel that they will lose friends and jobs because the thought of 'I have TB' (a social stigma)<sup>18</sup>. As an attempt to reduce the social stigma associated with TB and ill mental health in MDR-TB patients, it is necessary to incorporate mental health services into the TB care process<sup>18</sup>.

## Conclusion

To sum up, determinants of Loss to Follow-Up among MDR-TB patients include knowledge, drug side effects, family support, and social stigma. The researcher suggests that there should be socialization regarding all things considered important for MDR-TB patients to know in order to increase their level of knowledge, especially providing an understanding of the importance of taking medication regularly and not dropping out. In addition, it is necessary to provide motivational counseling from health workers and family support during MDR-TB treatment, particularly in controlling drug side effects and social stigma.

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