

THE HEALTH CENTRES SERVICE QUALITY EFFECTS ON MULTI DRUGS RESISTANT TUBERCULOSIS (MDR TB) PATIENTS' MEDICATION ADHERENCE IN JEMBER

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Received date: 01 June 2019

Revised date: 22 June 2019

Accepted date: 12 July 2019

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ABSTRACT

Background: Multi Drug Resistant TB (MDR TB) issue increased over the past five years. Inversely, the medication success continuously declines. This study aims at examining impact of health service quality provided by Health Centres on MDR TB patients' level of medication adherence in Jember. **Materials and Methods:** This study is analytic observational research applying cross sectional approach. Proportional cluster random sampling used to obtain 15 Health Centres with 89 MDR TB patients. Health care quality variables are tangible, responsiveness, empathy, reliability, and assurance with 36 assessment elements. The quality measurement uses scoring techniques. The logistic regression is used to examine health care quality impacts on medication adherence. The data is presented in tables, cross tabulations, and statistical analysis using SPSS 22.00. **Results:** Patients' medication adherence on good service quality amounted to 63,64%, while 43,43 % toward poor service quality. Health centre service quality significant value on patients' medication adherence is $p = 0.000$. **Conclusion:** The service quality significantly affects MDR TB Patients' medication adherence in the Health Centers of Jember.

KEYWORDS: Multi drugs resistant, service quality, medication adherence, Community Health Centers.

1.0 INTRODUCTION

In the world countries, including Indonesia, the biggest threat of resistant TB is the issues of Multi drugs resistant tuberculosis abbreviated as MDR TB. This disease has been resistant to isoniazid (INH) and rifampicin simultaneously with or without other anti-tuberculosis (OAT) medicines based on standardized laboratory examinations.^[1,2] In 2017, there are about 558,000 MDR TB cases worldwide and the success rate is 55%. In Indonesia, 5,070 patients diagnosed with the RR / MDR TB, and only 3,042 patients or 60% of them are starting treatment.^[3]

In the East Java, notified until 2018, the number of drug-resistant TB issues was 881 MDR TB cases, 59% of them were medicated and the remaining 41% were not performed any treatments. The medication outcomes through cohorts reached 46% of success rate, 39% of medication dropout, 3% of treatment failure and 26% of death.^[4] In the East Java, spesiffically in the district of Jember, the number of MDR TB cases increased over the past 5 years. Its number, until 2018, has reached 297 cases, or 10% of national MDR TB cases that perform treatments. The increase of MDR TB cases in Jember

since 2014 to 2018 were each 6 cases, 24 cases, 21 cases, 94 cases and 107 cases.^[5]

The increase of MDR TB cases in Jember is inversely proportional to the rate of the treatments' success which is low and continues to decline, namely 60% in 2014, 59% in 2015, and dropped to 36% in 2016. The national target of MDR TB medication success is expected to reach above 60%.^[6] The success is related to medication adherence behavior. The average of non-compliance of treatment percentage in MDR TB cases is 33.5% from 2014-2018 or over the past five years. The rate is relatively high because the national target should be below 20%.^[5]

The Health Center as the MDR TB medication provider should perform good health service as the patients expected.^[7] The patients often give up their treatments due to limited drugs availability, bad service and the absence of health workers. The quality of health service impacts on TB patients' medication adherence. Medication compliance of patients with long-term medication process is influenced by the quality of health services.^[8,9,10]

The health service factor related to patient medication adherence is the quality of health care provided. According to Robert and Prevest in Lupiyoadi, the quality of health services can be reviewed from the health consumers and providers.^[11] The quality of health service is the conformity between health care provided and the patients' needs, or with the provisions of service standards.^[12] It is often associated with healing, medication adherence, increased health status, fast service, satisfaction with the physical environment, etc. The duration of treatment for chronic disease and the severity of medication side effects should be supported by the quality of service, so that the level of medication adherence and the success of treatment increase, and it will prevent patients from any treatments dropping out.

The effect of the health service quality on medication adherence and the success of MDR TB patients' treatments was also conveyed by Vries *et al* in four European Union countries. Vries *et al* stated that the health care system, in this case the quality of health services, affects the management of MDR TB care. The factors that influence MDR TB management include health care system, timely diagnosis of drug resistance, financial systems support, patient-centered approaches, cross-sectorial collaboration, motivated and dedicated health workers, and good MDR-TB cross program management. Strengthening the health care system should be begun from the lowest health care facilities, namely Community health centers.^[13]

The observations results of pilot projects conducted at 5 health centers in the district of Jember revealed that there were units that did not have special treatment rooms for TB and MDR TB patients, sputum rooms, isolation rooms, no separated waiting rooms for infectious and non-infectious patients, implementation of the standard Infection Control and Prevention Program (PPI), officers responsible for multi programs (HIV and leprosy), absence of analyst officers, non-standby staff, and low monitoring of MDR TB patient drug side effects, and integration with programs such as HIV, diabetes, and maternal and child health. Based on these findings, it is necessary to conduct a research study and analysis of Health Centres service quality on the medication compliance of MDR TB patient in Jember.

Based on the above elaboration, it is significant to investigate the quality of health services in the Health Centers on the level of adherence to treatment for MDR TB patients in the district of Jember. This research was conducted by measuring the quality of health care based on the aspects of MDR TB service providers, namely Community Health Centers. Researchers conduct research study among the quality of Health Centers providing MDR TB treatment referring to the MDR TB service quality strategy and existing service standards.

2.0 MATERIALS AND METHODS

2.1 Research design

This research is quantitative with observational analytical design using cross sectional approach. The measurement of service quality uses scoring techniques reviewed from the independent assessment of medication providers namely the health centres, and the patients' medication adherence is identified from their medical records. The number of MDR TB patients in 2016 to 2018 was 182 cases which spread over 46 units from the total of 50 Community Health Centres in Jember. The research samples taken are 15 health centres divided into five regional clusters *i.e.*, the central, west, east, south and north clusters. The proportional cluster random sampling technique for get health centres as study object and total sampling used for sampling and obtained 89 MDR TB patients from those selected 15 Health Centres.

2.2 Research Variables

The dependent variable, *i.e.*, medication adherence is measured through medication reports in the ETB manager application and the TB.01 form. While the independent variable in this study is the quality of Health Care services. Measurement of service quality uses scoring techniques and determine the class criteria to (good, enough, less). The service quality is measured by comparing the implementation of health services to MDR TB services standards based on the national guidelines. It is measured through five-dimensional assessment including tangible, responsiveness, empathy, reliability and assurance. The dimensions are measured through each assessment elements associated with MDR TB services. The five dimensions assessment elements are as follows:

1. *Tangible*, Measured with the appearance of standard physical facilities (rooms/TB clinics/MDR TB), isolated rooms, and on standby MDR TB personnel.
2. *Responsiveness*, Willingness to help MDR TB patients, provide prompt service, drug side-effect monitoring, and MDR TB partnership program.
3. *Empathy*, Measured through counselling activities and home service (monitoring and motivation).
4. *Reliability*, Measured through MDR TB and medication management workshop, technology for recording and reporting, and drug side-effect management.
5. *Assurance* Measured through the existence of service management commitments in the form of guidelines, standardized MDR treatment procedures, logistics governance and the implementation of infection prevention and control (PPI) both managerial, administrative, personal protective equipment and the environment.

2.3 Research Data and Instruments

The medication adherence data is obtained from secondary data *i.e.*, documentation of MDR TB patients' treatment forms (TB.01). The primary data in this study consisted of the quality of health services through interviews with the health officers of TB programs. The

data collection instruments used were questionnaire and list check sheets. The instrument used in this study is the Modification of the Self-Assessment of the Health Services Quality. The data collection contains items of each quality of health services sub variable includes evidence of tangible, responsiveness, empathy, reliability and assurance. Each sub variable (quality dimension) is categorized in class by giving a score: "0 = invalid (if it only fulfil less than 20% of the assessment elements); 5 = partially valid (if it fulfil 20% -79% of the assessment elements) and 10 = completely valid (if at least meet 80% of the assessment elements)" Furthermore, the

quality of MDR TB service is determined "less, if the total score is 0 to 120; enough, if the total score is 121 to 240, and good, if the total score is 241 to 360".

2.4 Data Analysis

The health service quality impact on MDR TB medication adherence is measured by a logistic regression model. The significance of the statistical test is p value <alpha (0.05). The data is presented in table form, cross tabulation and statistical analysis using SPSS version 22.00.

3.0 RESULT

3.1 MDR TB Patients Characteristics

Table 1: MDR TB Patients Characteristic in 2016-2018 in Jember. Total %.

| | Individual Characteristics | n | % |
|------------------------------------|----------------------------|----|-------|
| Gender (n=89) | Man | 50 | 56,18 |
| | Women | 39 | 43,82 |
| Age (n=89) | 0 -5 years old | 0 | 0 |
| | 6 - 11 years old | 0 | 0 |
| | 12-25 years old | 12 | 13.48 |
| | 26-45 years old | 45 | 50.56 |
| | 46-65 years old | 27 | 30.34 |
| | >65 years old | 5 | 5.62 |
| Type of sufferer (n=89) | New | 38 | 42.70 |
| | Relaps | 28 | 31.46 |
| | Drop out of medicine | 13 | 14.61 |
| | Failed | 5 | 5.62 |
| | Collaborative (TB-DM) | 2 | 2.25 |
| | Collaborative (TB-HIV) | 2 | 2.25 |
| | Nonstandard treatment | 1 | 1.12 |
| Medication adherence status (n=89) | Obedient not obey | 66 | 74.16 |
| | | 23 | 25,84 |

The Table 1 above shows the distribution and frequency of MDR TB cases from 2016 to 2018 in Jember. The biggest cases of MDR TB were found in men (n = 50, 56.18%), adults (26-45 years old), i.e., 45 people (50.56%), new infected patients (n = 38, 42.70%). The

second highest percentage followed by a relapse of 28 (31.46%). Whereas, based on medication adherence status, the number of obedient patients was 66 patients (74.16%).

3.2 The Characteristics of Health Centre Services

Table 2: Characteristics of Health Center Service in District of Jember.

| Characteristics of Health Centre Services | n | % |
|--|----|-------|
| TB Program Officer | | |
| Gender | | |
| Man Women | 8 | 53,33 |
| Education Qualification Nurse | 7 | 46,67 |
| Midwife | 15 | 100 |
| Senior high school | 0 | 0 |
| Age | 0 | 0 |
| 26-45 years old | 6 | 40 |
| 46-59 years old | 9 | 60 |
| Type of Health Center | 15 | 100 |
| Inpatient Outpatient | 0 | 0 |
| Type of Laboratory Service | 7 | 46,67 |
| Microscopic Health Center Satelit Health Center | 8 | 53,33 |
| Laboratory Officers' Educational Qualifications | | |
| Diploma | 1 | 6,67 |
| Senior High School/equal (trained) | 14 | 93,33 |

The table 2 above shows that most TB Program officers are male (n = 8, 53.33%), elderly / 46- 59 year old (n = 9, 60%), and all of them are nurses. The type of Health Centre is entirely inpatient and as a satellite health center

(n = 8, 53.33%). All TB Program officers' educational qualifications are nurses. Most of laboratory officers' educational qualifications are high school graduate (n = 13, 93.33%).

3.3 Analysis of Health Service Quality Dimension on MDR TB Treatment Quality in Jember Health Centres

3.3.1 Identification of Service Quality Dimensions

Table 3: Identification Of Health Centres Service Quality Dimensions In Jember.

| Variable | | Category | | |
|---|--------|--------------|--------------------|------------------|
| | | Not Achieved | Partially Achieved | Totally Achieved |
| <i>Tangible</i> | | | | |
| a. Physical facilities (TB rooms and equipment) | n % | 2 13,33 | 3 20 | 10 66,67 |
| b. Officer Existence /onsite officer | n % | 1 6,67 | 5 33,33 | 9 60 |
| c. Availability of laboratory facilities | n % | 4 26,67 | 5 33,33 | 6 40 |
| d. Availability of phlegm (standardized) collection infrastructure | n % | 4 26,67 | 10 66,67 | 1 6,67 |
| e. Insulation (standardized) treatment room | n % | 1 6,67 | 10 66,67 | 4 26,67 |
| <i>Reliability</i> | | | | |
| a. Availability of MDR TB trained teams (1 doctor, 1 nurse and 1 analyst) | n % | 2 13,33 | 3 20 | 10 66,67 |
| b. Internal training / strengthening | n % | 2 13,33 | 5 33,33 | 8 53,34 |
| c. Availability of guidelines and SOP for management (management and implementation) of MDR TB medication | n % | 4 26,67 | 8 53,33 | 3 20 |
| d. Function of MDR TB services (diagnostics and treatment) | n % | 0 0 | 9 60 | 6 40 |
| e. Record and reporting standards | n % | 0 0 | 11 73,33 | 3 20 |
| <i>Responsiveness</i> | | | | |
| a. Implementation of management of side effects | n % | 6 40 | 7 46,67 | 2 13,33 |
| b. Impelemntasi Procedures for patients being lost to follow-up, dropping out and refusing | n % | 2 13,33 | 7 46,67 | 6 40 |
| c. Active TB discovery through contact investigation (community based) | n % | 0 0 | 9 60 | 6 40 |
| d. MDR TB patient support through group and community socialization | n % | 1 6,67 | 6 40 | 8 53,33 |
| e. Coordination / partnership for MDR TB prevention | n % | 1 6,67 | 12 80 | 2 13,33 |
| f. Public figure and cross sector empowerment | n % | 1 6,67 | 3 20 | 11 73,33 |
| g. Application of external health networking efforts | n % | 1 6,67 | 5 33,33 | 9 60 |
| <i>Empathy</i> | | | | |
| a. Providing education and counseling | n % | 2 13,33 | 6 40 | 7 46,67 |
| b. Friendly service and written | n % | 0 0 | 15 100 | 0 0 |
| c. Home visits (monitoring and motivation) | n % | 2 13,33 | 6 40 | 7 46,67 |
| <i>Assurance</i> | | | | |
| a. Proof of written commitment from the use of funds | n % | 4 26,67 | 5 33,33 | 6 40 |

| | | | | |
|---|---|-------|-------|-------|
| b. Coverage guarantees the willingness of medication | n | 1 | 5 | 9 |
| | % | 6,67 | 33,33 | 60 |
| c. Medication Adherence Guarantee | n | 3 | 8 | 4 |
| | % | 20 | 53,33 | 26,67 |
| d. Diagnostic Enforcement Administration | n | 5 | 3 | 7 |
| | % | 33,33 | 20 | 46,67 |
| e. Diagnostic Enforcement Process (mechanism) | n | 1 | 9 | 5 |
| | % | 6,67 | 60 | 33,33 |
| f. Application of collaborative HIV TB / MDR TB (HIV Unit) | n | 0 | 2 | 13 |
| | % | 0 | 13,33 | 86,67 |
| g. Penerapan kolaborasi HIV TB/MDR TB (Unit HIV) | n | 2 | 8 | 5 |
| | % | 13,33 | 53,33 | 33,33 |
| h. Application of MDR TB - DM collaboration | n | 1 | 9 | 5 |
| | % | 6,67 | 60 | 33,33 |
| i. Application of MDR TB - Child collaboration | n | 4 | 9 | 2 |
| | % | 26,67 | 60 | 13,33 |
| j. Guaranteed Availability and Logistics management | n | 0 | 11 | 4 |
| k. Implementation of Infection Prevention and Control (IPC) | % | 0 | 73,33 | 26,67 |
| 1. Management | n | 4 | 9 | 1 |
| | % | 26,67 | 60 | 6,67 |
| 2. Administration | n | 1 | 13 | 1 |
| | % | 6,67 | 86,67 | 6,67 |
| 3. Personal Protective Equipment (PPE) | n | 0 | 8 | 7 |
| | % | 0 | 53,33 | 46,67 |
| 4. Environmental control | n | 2 | 4 | 9 |
| | % | 13,33 | 26,67 | 60 |
| l. Implementation of Prophylaxis (preventative treatment) for children under five who have MDR TB home contact. | n | 13 | 2 | 0 |
| | % | 86,67 | 13,33 | 0 |

The table 3 above, in the tangible aspect, shows most of the health centres had complete physical facilities (n = 10, 66.67%), on standby officers (n = 9, 60%), availability of laboratory facilities (n = 6, 40%); some have availability of sputum collection infrastructure (n = 10.66.67%) and the availability of isolation treatment rooms (n = 10, 66.67%).

In the reliability aspect, most health centres have trained MDR TB team consisting of at least 1 doctor, 1 nurse and 1 analyst (n = 10, 66.67%) and carry out internal reinforcement (n = 8, 53.34%). Most health centers achieved partial availability of MDR guidelines and SPO for TB treatment (n = 8, 53.33%), carried out diagnostic and treatment functions (n = 9, 60%), implemented standard recording and reporting (n = 11, 73, 33%).

In the responsiveness aspect, most health centres achieved partially in relation to the implementation of management of effects and patients absence for treatment (n = 7, 46.67%), implementation of contact investigations (n = 9, 60%), and partnerships (n = 8, 80%). Most health centres have full achievement in relation to providing support through socialization and formation of TB associations (n = 8, 53.33%), empowerment of cross-sector community leaders (n = 11, 73.33%) and health external networks (n = 9, 60%).

In the empathy aspect, most health centres have provided education, counselling and home visits for direct monitoring of medication (n = 7, 46.67%). All of them have implemented friendly services (n = 15, 100%).

In the assurance aspect, most health centres have complete achievements regarding commitments and utilization of special MDR TB funds (n = 6, 40%), coverage of treatment availability (n = 9, 60%), application of MDR TB / TB - HIV collaboration (n = 13, 86.67%) and the application of PPI through environmental control (n = 9, 60%). Most health centres achieved coverage of treatment compliance (n = 8, 53.33), diagnostic mechanism (n = 9, 60%), application of MDR / TB - DM collaboration (n = 9, 60%), availability of logistical guarantees (n = 11, 73.33%) and the application of management IPC (n = 9.60%), administration (n = 13.86.67%), personal protective equipment (n = 8, 53.33%).

Table 4: Classification of Assessment Results on the Service Quality Dimensions of Health Center for Implementing MDR TB Medication in Jember.

| Variable | | Classification of Assessment Result | | |
|---------------------------------|---|-------------------------------------|--------|-------|
| | | Good | Enough | Less |
| <i>Tangible</i> | n | 8 | 4 | 3 |
| | % | 53.33 | 26.67 | 20 |
| <i>Reliability</i> | n | 8 | 4 | 3 |
| | % | 53.33 | 26.67 | 20 |
| <i>Responsiveness</i> | n | 9 | 5 | 1 |
| | % | 60 | 33.33 | 6.67 |
| <i>Empathy</i> | n | 7 | 6 | 2 |
| | % | 46.67 | 40 | 13.33 |
| <i>Assurance</i> | n | 8 | 4 | 3 |
| | % | 53.33 | 26.67 | 20 |
| <i>Mutu Pelayanan Puskesmas</i> | n | 8 | 4 | 3 |
| | % | 53,33 | 26,67 | 20 |

The table 4 above shows that most of the five service quality dimensions are classified as good, namely tangible (n = 8, 53.33%), reliability (n = 8.53.33%), assurance (n

= 8, 53.33%), responsiveness (n = 9, 60%), and empathy (n = 7, 46.67%). Most of the quality of MDR TB health centres services are good (n = 8, 53.33%).

3.4 The Impact of Health Centres Service Quality on Medication Adherence

Table 5: Cross Tabulation of MDR TB Service Quality in Medication Adherence for MDR TB Patients in Health Centers.

| Cross Tabulation of Variable | | | Service Quality | | | Total |
|------------------------------|----------|---|-----------------|--------|-------|-------|
| | | | Good | Enough | Less | |
| Medication | obedient | n | 42 | 19 | 5 | 66 |
| Adherence | | % | 63,64 | 28,79 | 7,57 | 100 |
| | not obey | n | 6 | 7 | 10 | 23 |
| | | % | 26,09 | 30,43 | 43,48 | 100 |

The table 5 above shows that most of obedient MDR TB patients receive good service quality (n = 42, 63.64%).

While most non-adherent MDR TB sufferers received service quality from the health centres (n = 10, 43.43%).

Table 6: Modeling Results of Logistics Regression Test in Service Quality to Medication Adherence of MDR TB Patients in Jember.

| Variable | B | p value | X ² | OR | 95% CI |
|-----------------|-------|---------|----------------|-------|---------------|
| Service Quality | 1.166 | 0.000 | 0.870 | 3.210 | 1.688 - 6.106 |

*p < 0.05, there is significant difference.

The table 6 above, there is a significant effect on the quality of health centres services on the medication adherence of MDR TB patient at the MDR TB treatment providers in Jember (p value 0.000 > 0.05, OR=3.210/95%CI, 1.688 - 6.106).

4.0 DISCUSSION

4.1. The characteristics of MTB Patients in Jember

In the district of Jember, male were found to suffer the majority of MDR TB cases in 2016- 2018 that reaches 50 cases (56.18%). This finding is related with previous studies stated that women are more likely to seek health services and tend to be more adherent to treatment with DOTS compared to men, so that the risk becomes smaller.^[15,16] Study at Persahabatan Hospital found that men were more likely to be absent from medication.^[17] Men have lower adherence than women, because they

have higher activity in their daily lives comparing to women, and they are responsible for the life of the family that they have to work. Most of them are active smokers. Active smokers tend to have higher possibilities to suffer TB comparing to passive or non-smokers. The tar and nicotine substances have been proof to be immunosuppressive by affecting the innate immune response and increasing susceptibility to infection.^[18]

Regarding the age, 50.56% of MDR TB cases were found in the adult age group (26-45 year old). Previous research found that most MDR TB patients in the productive age group ranged in age from 25 to 44 year old.^[17,19,20] Many MDR TB patients are of productive age because they have high mobility, therefore they tend to be disobedient to take OAT in previous TB treatment. Many of them are disobedient because they have to be responsible for the family's life. Risk factors that impact

of occurrence of TB on the productive ages are smoking, education, room condition and lighting. For patient health records, the new type has the highest percentage compared to the others, i.e., 42.70%.^[14] This finding does not support Nofizar et al (2010) that the risk factors for MDR TB were 92% for patients having two TB histories previously.^[19] Those who live at the same house, visiting a MDR TB high infected area, working in MDR TB infected area, and having close physical contact with the MDR TB patients tend to be infected with resistant M.TB.^[21,22] MDR TB patients may not show any symptom, until they are unknowingly transmitting the disease to others, even before he is ill.^[23] If the people around are infected with resistant germs, they may become drug resistant patients (primary resistance).

The cases of MDR TB in Jember certainly should be seriously overcome due to the high number of TB cases. In other words, levels of resistant TB germs transmission is high that may infect more people to suffer from MDR TB disease as well.

Based on treatment adherence status, 74.16% of MDR TB patients were obedient in taking medication. The achievement of the Medication compliance rate is classified as good and in accordance with the national target of > 70%.^[9]

Compliance to treatment of MDR TB patients is a patient's action to be willing to implement the rules for injecting and drugs taking in accordance with the established schedule and rules. The results of previous studies stated that people who do irregular treatment have a greater risk of developing MDR-TB 4.8 times greater than those who do regular treatment.^[24]

4.2 The Characteristics of Health Centres as MDR TB Medication Providers in Jember

TB health centres officials are mostly in the range of 46-59 years old or middle aged elderly (61.9%). The number of MDR TB patients' adherence to medication is closely related to the work performance of the health workers. Astuti stated the elder health workers have better performance due to their work experiences. A long-term MDR TB treatment process and medication side effects needs experienced health workers to provide medications. Their experiences encourage patients' motivation and effective service for patients' medication adherence.^[25]

The educational background of the laboratory officers are 86.66% high school graduate who have taken certain trainings. The standard of health centre human resources in TB health service i.e., 1 doctor, 1 nurse, and 1 trained laboratory analyst.^[26] The results of the USAID study in 2013 found that 20% of health care providers have lack number of staff and lacked skills staffs. Certainly, it will be the main obstacle in supporting the treatment compliance.^[27] The capacity development through training programs is an important element in providing

services to MDR TB patients. Its failure may lead to treatment failure, relapse, death, and the emergence of new resistance.

4.3 Relationship of Five Quality Dimensions on MDR TB Treatments in Jember

a. Tangible

The results of statistical asymmetry relationship shows that the five dimensions of service quality have a value of $p < 0.05$, meaning that all of the dimensions impact on the quality of MDR TB services in Jember Health Centres. The tangible aspects shows that the Health centres have complete physical facilities (n=10, 66.67%), the availability of laboratory (n=6, 40%); and the availability of isolation rooms (n=6, 40%). The society tend to assess the service quality of health care through availability of physical facilities and adequate equipment including tension, beds, consultation tables and drug storage.^[28] Complete physical facilities and good human resources increase patients' satisfaction for medication.

Everyone expects a good health care service with physical evidence because the MDR TB is classified as a contagious infectious disease and requires a long-term treatment process. WHO recommended outpatients hospitalizations for MDR TB treatments which is supported with standardized inpatients hospitalization rooms, particularly fulfilment of disease prevention and control aspects. Complete physical facilities and good human resources increase patients' satisfaction for medication.^[29]

The availability of isolation rooms supports the success of MDR TB treatments. The inpatient isolations room availability is useful for patients' medication barriers. The existing isolation room is also use for treatment initiations. The MDR TB medication needs to begin even before the growth media-based supporting reports. Monitoring of treatment can started from the beginning in an integrated and organized manner. The purpose of the initial evaluation is to identify patients who are at greater risk of side effects as well as its prevention and treatments.^[27]

The availability of laboratory support facilities will have significant implications for health care which requires expertise.^[27] The availability of laboratories and infrastructure for TB examinations such as molecular rapid testing is very important in supporting services. Short- term laboratory results are very important for rapid diagnosis and appropriate treatment, infection control, and public health management of drug-resistant TB.

b. Reliability

The reliability aspect shows that most of the Health Centers have trained MDR TB teams consisting of at least 1 doctor, 1 nurse and 1 analyst (n = 10, 66.67%) and perform internal reinforcement (n = 8, 53.34%). Most of them have achieved some availability of guidelines and

SPO for MDR TB treatment (n = 8, 53.33%). Al-Assaf (2009) opined that every employee has a reliable ability, understand the detail of work procedures, working mechanisms, corrects various shortcomings or irregularities that are not in accordance with work procedures and is able to show, direct and give correct direction for every health care service that the patients do not understand, so as to give a positive impact on these services, that the employees understand, master, are reliable, independent and professional for the work description.^[30] Direct treatment control and health care service should be carried out by experienced and educated health workers.^[21] Utomo et al (2017) stated that the inadequate MDR TB treatments by doctors and health providers is the impacts of limited availability of trained staffs and the miss implementation of medication guideline standards is a dominant factor that cause MDR TB cases in Grobongan District. The reliability aspect is a significant part for developing good medication quality for MDR TB cases.^[31] Officer reliability, and guidelines and procedure support system will strengthen the services provided that will impact on the satisfaction of patients.

c. Assurance

Regarding the assurance aspect, the commitment and management of funds for MDR TB prevention is 40%, the application of MDR TB / TB-HIV collaboration reaches 86.67% and the application of PPI has been partially achieved, environmental control (n = 9, 60%), management (n = 9.60%), administration (n = 13.86.67%), personal protective equipment (n = 8, 53.33%), availability of logistical guarantees (n = 11, 73.33%). According to Wijono in Al-Assaf, stated that the guarantee aspect relates to the knowledge and politeness of health workers, the capabilities and systems that govern all safe actions safely, thus it will foster public trust and customer confidence. Since anamneses, physical examination, other supporting examinations such as laboratory, radiology, fund care therapy or follow-up consultations and referrals, has to be examined whether they have met the standards and procedures for medical services that have been professionally established.^[30]

Based on the National TB Control in the 2016 Minister of Health Regulation and the Curry International Tuberculosis Center (CITC) about Drug-resistant tuberculosis: A Survival guide for clinicians, regional governments, central government and health providers must implement joint commitments in MDR TB prevention efforts.^[22,26] During treatment, patients must be closely monitored to assess medication response and identify the possibilities of side effects occurrence earlier. It must be guaranteed by the health center so that the patients are confidence to recover and to obey treatment.

Patients with HIV/AIDS have higher risk of developing infected TB compared to those who are

immunocompetence of Diabetes mellitus can be a risky factor to exacerbate MDR TB infection which can lead to late conversion, failure of therapy and a greater risk of resistance.^[32,33] Collaboration of the MDR TB program and HIV and DM is a form of system and coordination pattern in realizing good service quality to prevent patient severity and failure of MDR TB treatment.

A guaranteed Health services released through the availability of guidelines and procedures for medication and services. According to WHO (2014), the diagnosis of drug-resistant TB has profound implications for individual patients; therefore, the accuracy of laboratory diagnoses is very important and a comprehensive laboratory quality assurance (QA) program must be available to ensure the accuracy, reliability and results of germ growth with DST. Internal quality control (QC) and external quality assessment procedures (EQA), and monitoring performance indicators must be integral parts of laboratory operations. Guidelines and procedures will have a significant influence on service quality. The realization of the service quality cannot be separated from the relationship of the service procedures of the officers in providing services to patients. The better the service procedure, the higher the quality of service.^[29] Service facilities have a significant influence on service quality. Adequate service facilities make officers easier to work and provide good health care services. This condition will lead to the realization of good quality services.

The availability of drug logistics in providing services is mandatory for the health centers. The drugs stock must be recorded in detail to prevent vacancies and patients' disobedience to take medication which will lead to stop treatment.^[26,29] Strengthening management practices, especially those relating to the demand and distribution of TB drugs must be carried out sequentially to reduce the out of stock drugs. In this case the health center management officer must be able to have logistical management skills and good coordination with the doctor or nurse. The strategy to improve control management of drug-resistant TB related to service quality improvement factors has an impact on medication adherence. The strategy includes: the provision of diagnostic algorithms for quality TB screening, strengthening community involvement in monitoring treatment, implementing innovative courier systems for phlegm examinations from non-diagnostic centers, strengthening community involvement through the element of public private mix (PPM) at the level of Sub-district.^[22,23]

Furthermore, to ensure a safe health care facilities is the application of good infection prevention and control (PPI). Health workers responsible for handling TB patients has a high risk for TB infection. The application of PPI is an effort to improve service quality through a patient-based approach.^[22,26] The correct implementation of PPI can be examined through the number of transmission, especially patients to officers, or patients to

the family members.^[27,29] The implementation of PPI in the health centers must be strengthened to reduce TB infection. Knowledge of infection control and the provision of standardized infrastructure, and paying attention to aspects of the PPI will form a secure service system for patients and health workers. Patients need to understand the pattern of infection control, in addition to increasing awareness of clean and healthy lifestyle, it also guarantees safety for the family, especially for officers such as the use of masks and correct cough ethics.

d. Responsiveness

The responsiveness dimension shows 60% of the health centers in Jember have good levels of responsiveness. This aspect has complete accomplishments in the implementation of effects management and patients' absence for treatment (n = 7, 46.67%), implementation of contact investigations (n = 9, 60%), and partnership implementation programs (n = 8, 80%) Most of Health Centers reached full accomplishment in relation to providing support through socialization and formation of TB associations (n = 8, 53.33%), empowerment of cross-sectoral community leaders (n = 11, 73.33%) and external health networks (n = 9, 60%). According to Tjiptono (2012: 175) responsiveness is related to the willingness and ability of service providers to help customers and respond to their requests immediately.^[28] The quality of service viewed from the aspect of health service factors is the assessment of TB patients towards efforts of the health service units to treat TB patients including: availability of OAT, attitudes of health workers, counseling, location, and home visits.^[12] A good responsiveness is given by providing explanations, guidance, and direction that directly provide an overview about the services provided.

The efforts to improve patient services is realized by providing support to patients through the formation of groups of patients or former patients in the form of associations or peer group support. Peer group supports is functioned as peer educators. Hasanah (2017) state that motivation and enthusiasm support from peer group support can improve MDR TB patients' adherence to medication at the Klampis Bangkalan Health Center. The existence of peer group support provide enthusiasm, fosters a sense of being loved, valued, and more so that they will be more obedient to perform treatment.^[34] Community and families members should also get training as a supporting element for patients. They will be trained using specific TB modules so they can help to identify and take TB suspects to the health facilities, and participate in monitoring the patients' treatment to regularly take medication.

Contact investigation activities through direct visits is an attempt to break the chain of transmission and support the process of treatment services to patients who are undergoing medication. This activity is part of a rapid response and support for monitoring patients' medication

directly. It aims to find out transmission sources, to identify the family members, and to educate a healthy living style.^[21]

The service response, management and side effects control, will encourage patient's motivation and independence in undergoing the treatment process. The side effects monitoring is carried out since the beginning and along the treatment process.^[31] Treatment adherence of TB patients in Zambia was influenced by several factors including the medication side effects. When TB sufferers do not receive any information relating the possible treatment side effects and how to manage them, they may tend to stop taking medication. The foundation of TB treatment success is the early detection of disease, initiation of treatment, and completion of the prescribed treatment. The medication compliance is influenced by many factors, including the treatment side effects.^[22,27] If the TB patients do not receive adequate information about the possible side effects and how to handle them, the patients tend to stop taking medication.

The WHO consolidation resulted that the prevention of transmission is done through close contact screening of MDR TB patients. It aims to guarantee patients and families to break the chain of transmission within the household. Under five children living with TB sufferers and TB resistant have a greater risk of infection than the elder age. Therefore, these infants should receive prophylactic protection.^[21]

Improving service quality for national TB prevention, contact investigation for all TB patients, especially MSR TB patients, needs to be taken. The patients with HIV / AIDS have a higher risk of contracting TB germs compared to immunocompetent individuals. Diabetes mellitus is also a risk factor for exacerbating MDR TB infection which can lead to delayed conversion, failure of therapy and a greater risk of resistance.^[32,33]

e. Empathy

In the dimension of empathy, 46.67% health workers have good level of empathy. In this aspect, it is known that most of them have carried out education and counseling and home visits for direct monitoring of medication (n = 7, 46.67%). In providing health care service, empathy is released by giving attention, seriousness, sympathy, understanding and involvement of the parties concerned to develop and serve in accordance with the level of each party's understanding, as well as prevention and family protection, and early discovery. A smooth and good quality health service will be running if the parties involved show empathy or attention, and commit to complete the treatment process.^[30]

This study indicates that the measurement of empathy refers to providing education and counseling to MDR TB patients, monitoring and motivation through home visits, and performing a friendly service. The empathy shown by health officers will certainly affect the quality of

health care services, and encourage the patients to follow any medication proces.^[27] Doctors or paramedics need to make informed consent, provide education or counseling. Therefore, the patients will be satisfied with the service or their illness IEC they receive.^[36]

Based on Drug Resistant Tuberculosis Guideline for Clinician, it states that information support through providing education, counseling and motivation, and psychological support through friendly service attitudes will increase patients' comfort in undergoing treatment and will further affect their medication adherence.^[22] There is a relationship between MDR TB awareness or knowledge and the medication adherence. Providing counseling and motivation is an important effort to improve health care service quality and to prevent patients from treatment drop out. Education and motivation is given continuously before medication, within the treatment process and after the medication is done both in the Health Centers and at home visit activity. According to Utomo et al (2017), education and service attitudes performed by TB program providers and doctors play significant role in increasing the patients' trust to undergo treatment, and encouraging medication adherence and family roles.^[31,37]

4.4 The Impact of Service Quality on Medication Adherence of MDR TB Patients in Jember

The analysis results showed that 63.64% of obedient MDR TB patients due to the good quality of health care services provides by the Health Centers. While most of the non-adherent MDR TB patients is caused by the poor quality services they receive (n= 10, 43.43%). Therefore, the health service quality of MDR TB treatment providers in Jember significantly affects the patients' medication adherence. An effort to improve service quality and medication guidelines is a patient-centered approach. It aims at developing medication adherence, improve quality of life, and alleviate the suffering of MDR TB patients. This approach is based on the mutual respect between the patients and health service providers.^[22,29]

The results of this study support Vries (2017) that measure the health quality system in increasing patients' regular treatment and achieve a successful treatment program as a form of MDR TB prevention. According to him, the factor of improving the quality of medication service management can directly affect the adherence of MDR TB patients for treatment. Management factors that influence patient medication compliance include: a) physical facilities and MDR-TB specialists in the country; b) methods for collecting data of treatment results; c) guidelines and protocols available for the management of MDR-TB patients; d) organization and financing of the health system; e) health and social quality system organization; f) health system regulations related to TB and MDR-TB treatment; g) availability and supply of MDR- TB drugs; h) public health information approach for the prevention and control of MDR-TB;

and i) attitudes of health care workers to MDR-TB treatment.^[13]

The results of this study does not support Sholikhah (2012) which states that the quality of health services for medication adherence of pulmonary TB patients obtained insignificant p value $0.498 > 0.05$. It means the service quality and medication compliance for pulmonary TB patients in Gatak Health Center do not have any significant relationship. The relationship absence exist because the quality of health service (availability of drugs, staff attitudes, home visits, counseling and location) is not the factors of MDR TB patients compliance for undergoing treatments. There instead factors that influence medication adherence of TB patients such as knowledge, trust, attitude or motivation to recover, family and social support. The different result of the studies is caused by different variable, subject and location of the research. Sholikah (2012) applies variables of service quality factors included the availability of drugs, attitudes of staff, home visits, counseling and location, while this study use more complex and detailed variables by using 5 dimensions of service quality variables (tangible, responsiveness, reliability, empathy and assurance) which has various elements to assess. In Sholikah (2012) the influencing factors include knowledge, patients trust, attitudes and motivation for recovery, and family and social support.^[12]

Another differences is the subject of study. This study examine MDR TB while Sholikah (2012) discuss TB cases. This difference is significant considering the differences of medication management, side effects, length of treatment process and quality of services. Furthermore, the last difference is location of the study. This research examined 15 Health Centers located in the district of Jember, while Sholikah (2012) did the research in Gatak Health Centre, which possibly have different service characteristics. Thus, these three different analysis factors distinguish the results of this study and the previous research.

5.0 CONCLUSION AND RECOMMENDATION

The quality dimensions including tangible, reliability, responsiveness, empathy, and assurance affected the quality of MDR TB service in Jember Health Centers. The results of the quality analysis revealed that the service quality significantly affected the medication adherence of MDR TB patients at the Health Centers of Jember.

ACKNOWLEDGEMENT

Our sincerest appreciation dedicated to the Department of Health Service Management, Magister of Public Health, Jember University for the esteemed opportunity of learning and gaining writing experience given to us in the process of producing this manuscript.

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