A Review: Factors Affecting Quality of Life and Adherence of Tuberculosis Patients in Indonesia

Rizka Aulia Putri[1], Widya Kardela[1] Ifora Ifora[1]

Department of Pharmacology and Clinical Pharmacy, School of Pharmaceutical Sciences STIFARM Padang, West Sumatera, Indonesia, 25147

Abstract

Background: *In the treatment of tuberculosis the patient's adherence greatly affects the quality of life. Lack of knowledge about the importance of treatment can reduce the patient's quality of life. So that it can lead to failure of treatment goals and even increase mortality.*

Objective: *To provide the current evidence of the factors that affect the quality of life and adherence levels of tuberculosis patient's in Indonesia.*

Research Methods: *A review of factors affecting the quality of life and level of adherence to therapy for tuberculosis patients was conducted by searching bibliographies from databases such as pubmed, science direct, and google scholar in the last 10 years from 31 August 2011 to 31 August 2021. The keywords used were as follows: quality of life, adherence, tuberculosis, Indonesia.*

Results: *In this review article, there are 3 articles discussing the quality of life tuberculosis patients and 5 other articles discussing the level of adherence are family support, age, gender, level of education, health behavior (level of knowledge, attitudes, roles of health workers and the role of drug taking supervisors, regimens or doses of drugs) that are not appropriate, expensive drug prices, interrupted drug supply, drug side effects, and access to health services. Factors that affect the quality of life are family support, comorbidities, and the physical domain. Therefore, there is need for counseling, monitoring, and periodic evaluation, as well as providing motivation for tuberculosis patients.*

Conclusion: *Generally, family support, age, gender, education level, health behavior, inappropriate drug regimen or dosage, interrupted drug supply, drug side effects, and access to health services reduce the level of adherence of tuberculosis patients to treatment. Family support, comorbidities, and physical domains also affect the quality of patients life. The physical dimensions include activities of daily living, energy and fatigue, mobility, pain and discomfort, drug dependence, and work capacity.*

Keyword: *Quality of Life, Adherence, Tuberculosis, Indonesia*

I. Introduction

Tuberculosis is an infectious disease that can cause poor health. Tuberculosis is one of the leading causes of death worldwide and the leading cause of death for one infected person. *Bacillus Mycobacterium tuberculosis* is a disease agent that causes tuberculosis to be transmitted when an infected person releases tuberculosis bacteria into the air such as by coughing.[1] There are a total of 8.9 million people with tuberculosis with a proportion of 80% in developing countries with 3 million deaths per year and 1 person can be infected with tuberculosis every second. Indonesia is now ranked as the fifth country with the highest tuberculosis burden in the world.[2] This disease is the disease with the most sufferers in Indonesia.[1]

Tuberculosis is still one of the main killers for humans if not treated properly, this disease can cause death almost 5 years after suffering from tuberculosis. The presence of contact with positive acid-fast bacilli (AFB) can be a dangerous source of transmission because it will infect about 65% of the people around it. The source of transmission is pulmonary tuberculosis patients with positive acid-fast bacilli (AFB), especially when coughing or sneezing, where the patient spreads germs into the air in the form of phlegm splashes, if not treated immediately, within one year it will spread to 10-15 people. Patient adherence to treatment is a serious health problem and often occurs in patients with chronic diseases, such as pulmonary tuberculosis. Many factors are associated with adherence to pulmonary tuberculosis therapy, including patient characteristics, the relationship between health care workers and patients, therapeutic regimens, and the health service delivery system.[3] Factors that can support adherence are behavioral factors of knowledge of tuberculosis, patient's perception of pulmonary tuberculosis, perception of distance, perception of officers, and drug-taking supervisors.[4]

Based on gender, the number of new cases of tuberculosis in 2017 in males was 1.4 million, the number of new cases of tuberculosis in Indonesia, as many as 420.994 cases in 2017, was greater than in

women. Even based on a tuberculosis prevalence survey, the prevalence in men is 3 times higher than in women.[5] In this case, the World Health Organization (WHO) recommended the Directly Observed Treatment Short-Course (DOTS) strategy as a strategy in controlling tuberculosis since 1995. The main focus of the Directly Observed Treatment Short-Course (DOTS) is the discovery and cure of patients, priority is given to patients with infectious types of tuberculosis. This strategy will cut off the transmission of tuberculosis thereby reducing the incidence of tuberculosis in the community. Finding and curing patients is the best way to prevent tuberculosis transmission.[3]

Quality of life is an important indicator to assess the success of health care interventions both in terms of prevention and treatment.[6] The length of treatment undertaken by tuberculosis sufferers will make the patient feel bored because of taking a lot of drugs and the interrupted treatment will start again from the beginning. This will affect the quality of life of tuberculosis patients and the side effects caused by tuberculosis sufferers such as nausea, abdominal pain, and no appetite. Suriya Melti in 2018 stated that depression can also arise due to the length of treatment carried out by tuberculosis sufferers, besides the stigma that exists in the community regarding tuberculosis which is very contagious, then this can worsen the situation of tuberculosis sufferers because they feel that they are not accepted by the community, such as being ostracized and making them worse off as depression sufferers. Based on Suriya's research in 2018, it was shown that 57.0% of tuberculosis patients sometimes feel alone and 54.1% of tuberculosis patients feel very afraid of their disease. [7]

Non-adherence in regular treatment for tuberculosis sufferers remains an obstacle to achieving a high cure rate. The high rate of drug withdrawal results in high cases of bacterial resistance to antituberculosis drugs which require greater costs and increase the length of treatment.[8] Based on the results of Zulkifli et al's 2019 research, one of the factors that influence non-adherence to the use of antituberculosis drugs is the lack of motivation from the patient himself in complying with the drug-taking schedule.[9] Tukayo et al's research, 2020 concluded that adherence to taking anti-tuberculosis drugs was influenced by knowledge, attitudes of tuberculosis sufferers, side effects of drugs, access to health services, attitudes of health workers, and family support.[10] Widyastuti et al also stated that the state of health services found in a place also affects the spread of tuberculosis in that place. [11]

Muna and Soleha's 2014 research concluded that family factors are the main factors that affect patient adherence to treatment by 22 times compared to patients who lack motivation from their families. [12] The research of Ruru et al 2018 also stated that there are several factors that can cause non-adherence to tuberculosis treatment including age, history of moving house in the last year, and living far from treatment centers. [13] From the results of the research by Gunawan et al, 2017 it appears that patients with pulmonary tuberculosis who have high medication adherence are influenced by good patient motivation, good family roles, and the role of drug-taking supervisors will be able to change the patient's mindset to comply in all treatment procedures. Pulmonary tuberculosis so that the patient can recover. [14] In this review article some of the latest research results will be describedrelated to the factors that affect the quality of life and the level of adherence of tuberculosis patients in undergoing treatment.

II. Methods

A review of the quality of life and level of adherence to therapy for tuberculosis patients was carried out by searching bibliographies from databases such as PubMed, Science Direct, and Google Scholar in the last 10 years from 31st August, 2011, to 31st August, 2021. The keywords used were as follows: quality of life, adherence, tuberculosis, Indonesia. Inclusion criteria in this review are all studies related to factors that affect the level of adherence or quality of life of tuberculosis patients conducted in Indonesia, all articles use the Short Form (SF-8) questionnaire, World Health Organization Quality of Life (WHOQOL)-Brefjk) to assess the quality of life, all articles used a closed questionnaire (Guttman Scale), Short Form 36 (SF-36), Morisky Medication Adherence Scale-8 (MMAS-8), Directly Observed Treatment Short-Course (DOTS), Continuous Single-Interval Medication Availability (CSA), Medication Adherence Report Scale (MARS), and all articles are in Indonesian or English. Exclusion criteria are articles that have never been quoted or cited before, articles that are not in full text, articles in the form of editorials, expert opinions/comments, case studies, reviews (narrative, systematic, meta-analytical).

III. Result and Discussion

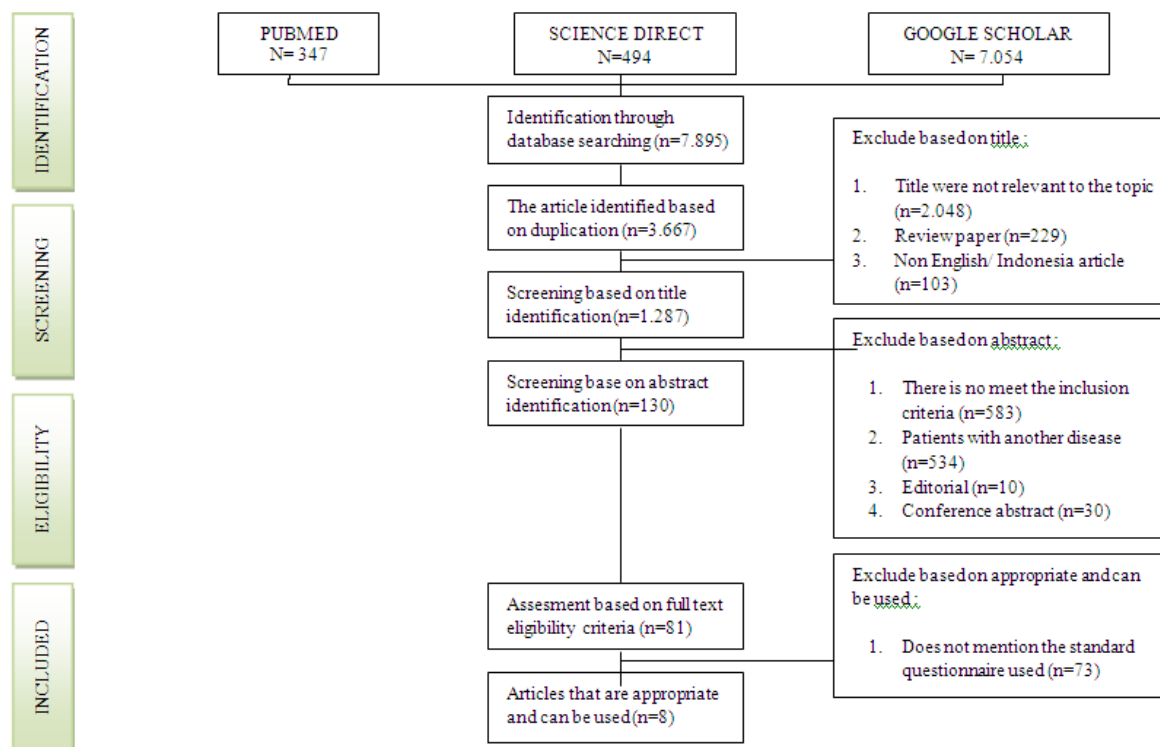Based on the results of the article screening of Figure 1, the obtained 8 articles are used as shown in Table 1 and 2.

Figure 1. Prisma Flowchart of Literature Search

Table 1. Table 1. Factors affecting the quality of life of tuberculosis patients

Reference	Population	Description of the Quality of Life	Factor
[15]	Patients in Selebar Subdistrict, Bengkulu City Total patients (57)	High quality of life (both physical and mental scales)	Family support
[16]	Patients at Hospital X Tasikmalaya City Total Patients (16) Male (9) Female (7)	Moderate quality of life 68.8% and low quality of life 31.2%)	Physical domain (daily activities, energy and fatigue, mobility, pain and discomfort, sleep and rest, drug dependence and medical assistance, and work capacity).
[17]	Patients in 5 Puskesmas and 2 Hospitals in Surabaya Total Patients (157) Male (75) Female (82)	Quality of life high 70.97% Low 36.78% (Physical Domain)	Domain physical, age, education level, comorbidity, and mental disorders

Quality of Life of Tuberculosis Patients

According to a study conducted by researchers before Hariadi et al, 2019 at the Health Clinics of Selebar District in the City of Bengkulu on 57 patients using Short Form 8 (SF-8) questionnaires concluded that the support from patient's family can increase the level of medication adherence so that it can improve the patient's quality of life above 50%. The results of the Short Form 8 (SF-8) questionnaire analyzed using chi-square showed a significant relationship between family support and the quality of life of tuberculosis patients. The affected sufferer must be given motivation from the family to have the spirit and encouragement to recover. Family support will increase the patient's confidence to face problems and improve the quality of his life. The quality of life of tuberculosis patients with high quality both on a physical and mental scale shows that there is a significant relationship between family support and the quality of life of tuberculosis sufferers. [15]

A similar study was also conducted by Nurhayati et al 2020 which was conducted on 16 tuberculosis patients at dr. Soekardjo Hospital in Tasikmalaya City using the World Health Organization Quality of Life (WHOQOL) questionnaire stated that the quality of life that is most influenced by therapy adherence is the physical domain. Physical dimensions include daily activities, energy and fatigue, mobility, pain and

discomfort, sleep and rest, dependence on drugs and medical assistance, and work capacity. The results of this study showed that from 16 patients the quality of life was found to be at a moderate level with as many as 11 people with a percentage (68.8%).[16]

Based on research conducted by Juliasih et al 2020, which was conducted on 157 tuberculosis patients in 5 Health Centers and 2 Hospitals in Surabaya using the RAND-36 Health Item Survey questionnaire, it was concluded that gender had no significant effect on the quality of life of tuberculosis patients, and age only affects the health domain in general. In addition, education level affects physical function and role limitations due to emotional problems. Comorbidity affects several domains, namely general health, pain, physical function, role limitations due to physical health, and role limitations due to emotional problems. Mental distress has a significant effect on the quality of life in all domains. [17]

Table 2. Factors affecting tuberculosis patients adherence rate

Reference	Population	The Level of Adherence	Factor
[18]	Patients in Harapan Raya Health Center, Pekanbaru Total patients (43) Male (30) Female (13)	Adherence 69.8%	Patient characteristics (age, gender, adherence to treatment).
[19]	Patients at the Major General HA Thalib Hospital, Kerinci Regency Total patients (27) Male (18) Female (9)	Moderately adherence (75.18%)	Therapy factors, health system factors, environmental factors, socio-economic factors, and family support factors.
[20]	Patients at the Seberang Padang Health Center September 2012-January 2013 Total patients (34) Male (25) Female (9)	Adherent 61.8% Non-adherent 38.3%	Health behavior (level of knowledge, attitudes, and roles of health workers) and the role of the drug taking supervisor.
[21]	Patients at Gunung Jati Hospital, Cirebon City in 2017 Total patients (103) Male(45) Female (58)	High Adherence Rate 54.36%.	Patient characteristics (gender, productive age, education, not working, non-smoking habits, duration of treatment <6 months, absence of comorbidities
[16]	Patients at Hospital X Tasikmalaya City Total patients (16)	Medium adherence level 56.2%	Psychological domain and therapeutic adherence

Adherence Level

The result study wich conducted by Kurniawan et al at Harapan Raya Health Center Pekanbaru there were 43 respondents, 30 were male and 13 were female using the Directly Observed Treatment Short-Course (DOTS) questionnaire. This study concludes that age and gender can affect the adherence level of pulmonary tuberculosis patients. The results show that the age characteristics of the majority of respondents are productive age (83.7%), male (69.8%), and adhere to treatment. [18] In line with the research of Susilo et al. 2018that stated that based on age, the largest group is the productive age group (< 55 years), namely 61 respondents (59.22%).[21]

Based on the results of Pameswari et al's 2016 research conducted on 27 respondents using the Continuous Single-Interval Medication Availability (CSA) questionnaire, it was found that there were 15 respondents (55.56%) who were adherent, 9 respondents (33.33%) quite adherent and 3 respondents (11.11%) did not comply with the treatment of tuberculosis. This study also mentions that there are factors that influence the level of adherence such as drugs, irregular use of drugs, and the occurrence of drug resistance. [19]

The Directly Observed Treatment Short-Course (DOTS) Questionnaire was applied to 61.8% adherent patients and 38.3% non-adherent patients. The results showed that there were various factors causing non-adherence to medication taking in tuberculosis patients, namely the human factor of the Drug Taking Supervisor (PMO) and the patient as the main cause. Factors that influence the level of adherence to treatment for tuberculosis sufferers are health behavior (level of knowledge, attitudes, and roles of health workers and the role of the Drug Taking Supervisor. [20]

Susilo et al's 2018 research conducted at Gunung Jati Hospital, Cirebon City in 2017 of 103 respondents concluded in his research that based on the Medication Adherence Report Scale (MARS) questionnaire conducted on 103 respondents, there were 58 female respondents and 45 male respondents. The results showed that the characteristics of tuberculosis patients were dominated by females by 56.31%, productive age by 59.22%, elementary education by 50.48%, not working by 38.82%, non-smoking habits by 77.66%. Tuberculosis patient adherence can be said to be good because it has high adherence in taking

medication with more than 50% (54.36%). This is a factor that can support the successful treatment of tuberculosis patients. [21]

The results of the research by Nurhayati et al 2020 concluded that from the data obtained using the Morisky Medication Adherence Scale-8 (MMAS-8) questionnaire, patients with the most medication adherence were patients with moderate levels of adherence, there were 9 people (56.2%), patients with a high level of adherence to medication 5 people (31.2%), with low adherence, were only 2 people (12.5%). Based on research conducted directly on patients, most patients understand and comply with antituberculosis drug treatment procedures so that they have moderate therapeutic adherence due to patient constraints who have difficulty taking medication. [16]

Drug regimen is the third dominant factor that influences non-adherence to medication in tuberculosis patients. In line with the research conducted by Pohan et al 2012 at the dr. Ario Wirawan Lung Hospital Salatiga this factor in the high category (0.51) affects the non-adherence to taking medication for tuberculosis patients. Lack of understanding from patients about taking drugs, especially antibiotic drugs in this case anti-tuberculosis drugs cause patients to stop taking drugs when the patient feels healed. [22] Because one of the supports for the success of tuberculosis treatment is to find out how far the patient's knowledge about tuberculosis is. [23] The knowledge factor on medication adherence is also supported by Kondoy's research. According to Kondoy et al, patient knowledge has an effect of 48.5% on patient adherence in five Health Centers in Manado City. [24]

IV. Conclusion

Based on the results of this review, in general, family support, age, gender, education level, health behavior, inappropriate drug regimen or dosage, interrupted drug supply, drug taking supervisors, drug side effects, and access to health services reduce the level of tuberculosis patient adherence in treatment. Family support, comorbidities, and physical domains also affect the quality of life. The physical dimensions include activities of daily living, energy and fatigue, mobility, pain and discomfort, drug dependence, and work capacity. Therefore, to support the success of therapy in improving the quality of life, it is necessary to monitor the level of adherence to treatment of tuberculosis patients, both from family support, comorbidities, and drug-taking supervisors so that therapy failure and sudden cessation of treatment can be avoided. In this case, the quality of life and the level of adherence of tuberculosis patients are expected to increase and recover.

References

[1]. World Health Organization, "Global Tuberculosis Report 2020, " *Journal of Chemical Information and Modeling,* 53(9), 2020.
[2]. I. D. Sari, R. Mubasyiroh, & S. Supardi, "Relationship of Knowledge and Attitude with Medical Adherence of Out Patient Pulmonary TB Patients in Jakarta in 2014, " *Health Research and Development Media,* 26(4), 243–248, 2017.
[3]. Ministry of Health of the Republic Indonesia."National Guidelines for Tuberculosis Control," Jakarta; Ministry of Health of the Republic of Indonesia, 2011.
[4]. D. H. Wulandari, "Analysis of Factors Associated with Advanced Pulmonary Tuberculosis Patient Adherence to Taking Medicines at the Integrated Health Hospital in 2015," *Journal of Hospital Administration,* (2), 17–28, 2015.
[5]. Ministry of Health of the Republic Indonesia, "Center for Data and Information of the Ministry of Health of the Republic of Indonesia, Tuberkulosis, " (1), April, 2018.
[6]. T. S. Putri, "Quality of Life in Pulmonary Tuberculosis Patients Based on Aspects of Adherence with Treatment at Padasuka Health Center Bandung City," *J. of Nursing Aisyiyah,* (2), 2015.
[7]. M. Suriya, "Factors Associated with Quality of Life of Pulmonary Tuberculosis Patients in Lubuk Alung Special Hospital, West Sumatera," *J. Keperawatan Abdurrab,* 2(1), 29–38, 2018.
[8]. Ministry of Health of the Republic Indonesia, "National Guidelines for Tuberculosis Management Medical Services," Jakarta; Ministry of Health of the Republic Indonesia, 2013.
[9]. Zulkifli, "Tuberculosis Patient Adherence Rate in Program Drug use at North Galesong Health Center, Takalar Regency in 2019," *Indonesian Pelamonia Health Research Journal,* 1(1), 41–57, 2019.
[10]. I. J. H. Tukayo, S. Hardyanti, and M. S. Madeso, "Factors Affecting Taking Anti Tuberculosis Drugs in Pulmonary Tuberculosis Patients at Waena Health Center," *J. of Poltekkes Jayapura,* (3), 3–8, 2020.
[11]. S. D. Widyastuti, R. Riyanto, and M. Fauzi, "Epidemiological Description of Pulmonary Tuberculosis (Pulmonary TB) in Indramayu Regency," *J. Care Scientific of Health Sciences,* 6(2), 102, 2018.
[12]. L. Muna and U. Soleha, "Family Motivation and Social Support Affect Medication Adherence in Pulmonary Tuberculosis Patients at Bp4 Pulmonary Polyclinic Pamekasan," *J. of Health Science*, 7(2), 172–179, 2018.
[13]. Y. Ruru *et al.,* "Factors Associated with Non-Adherence During Tuberculosis Treatment Among Patients Treated with DOTS Strategy in Jayapura, Papua Province, Indonesia," *Global Health Action*, 11(1), 2018.
[14]. A. R. S. Gunawan, R. L. Simbolon, D. Fauzia, and 2017, "Factors Affecting the Level of Patient Adherence with Pulmonary Tuberculosis Treatment in Five Public Health Centers in Pekanbaru City," *J. Online Student,* 4(2), 1–20.
[15]. E. Hariadi, F. Aryani, and E. Buston, "Relationship Between Family Support and Quality of Life for TB Sufferers in the Selebar District of Bengkulu City in 2018," *J. Nursing Public Health*, 7(1) 46–51, 2019.
[16]. A. Nurhayati and N. Rahayuningsih, "Analysis of Quality of Life (QoLy) and Theraphy Adherence in Pulmonary Tuberculosis Patients at Hospital X Tasikmalaya City ," *J. of Pharmacopolium,* 3(3), 183–189, 2020.
[17]. N. N. Juliasih, N. M. Mertaniasih, C. Hadi, Soedarsono, R. M. Sari, and I. N. Alfian, "Factors Affecting Tuberculosis Patients Quality of Life in Surabaya, Indonesia," *J. of Multidiscipnary Healthcare,* (13),1475–1480, 2020.
[18]. Kurniawan, Nurmasadi, S. R. HD, and G. Indriati, "Factor Affecting Tuberculosis Cure," *J. Online Student.*, 2(1), 2015.
[19]. P. Pameswari, A. Halim, and L. Yustika, "Level of Adherence with Drug use in Tuberculosis Patients at Mayjen H.A Thalib Hospital, Kerinci Regency," *J. Sains Farm. Klin.*, 2(2), 116, 2016.

[20]. N. Rahmi, I. Medison, and I. Suryadi, "The Relationship Between the Adherence Level of Pulmonary Tuberculosis Patients with Health Behavior, Side Effects of OAT and the Role of PMO in Intensive Phase Treatment at the Seberang Padang Health Center September 2012- January 2013," *Andalas Health Journal*, 6(2), 345, 2017.

[21]. R. Susilo, A. Maftuhah, and N. R. Hidayati, "Adherence of Pulmonary Tuberculosis Patients with the Use of Pulmonary Tuberculosis Drugs at Gunung Jati Hospital, Cirebon City in 2017," *Medical Science Journal Scientific Pharmacy,* 2(2), 83–88, 2018.

[22]. J. A. Pohan and T. E. Budiningsih, "Factors that Influence Non-Adherence to Take Medication for Tuberculosis Patients at the Pulmonary Hospital, dr. Ario Wirawan Salatiga," *Journal of Scientific Psycology,* 4(3), 1–5, 2012.

[23]. Rusman and S. B. K, "Factors Affecting Pulmonary TB Patients on Adherence with Taking Anti-Tuberculosis Drugs at Jati Sawit Health Center Indramayu," *Journal of Public Health,* 4(1), 33–40, 2019.

[24]. P. P. . Kondoy, D. V Rombot, H. M. . Palandeng, and T. A. Pakasi, "Factors Associated with Pulmonary Tuberculosis Adherence in Five Public Health Centers in Manado City Treating Patients," *Journal of Community and Tropical Medicine,* 2(1), 1–8, 2012.