

## Risk factors of quality of life among tuberculosis patients

Liena Sofiana, Suci Musvita Ayu, Yuniar Wardani, Evelyn Puspaningrum, Dinda Dwi Hadianti

Faculty of Public Health, Universitas Ahmad Dahlan, Yogyakarta, Indonesia

### Article Info

#### Article history:

Received Apr 30, 2021

Revised May 12, 2022

Accepted Jun 20, 2022

#### Keywords:

Medication adherence

Quality of life

Self-efficacy

Tuberculosis

### ABSTRACT

Indonesia has the world's third highest tuberculosis (TB) burden. As a result, Indonesia continues to face TB control issues, accounting for 8% of all tuberculosis cases worldwide. The case results were made in 2018 and discovered 1,016 persons with positive smear as many as 436 TB illness can have an influence on patients' quality of life. The goal of this study was to determine the risk factors of TB patients' quality of life in Sleman Regency, Special Region of Yogyakarta, Indonesia. This research is a cross-sectional analytic observational study. Respondents were the 2nd trimester tuberculosis patients who were still receiving treatment at all Puskesmas in Sleman Regency, Yogyakarta Special Region, Indonesia in 2020. Purposive sampling was used during the sample process. The WHO quality of life (WHOQOL-BREF) questionnaire was used to assess quality of life, while the Morisky Medication Adherence Scale was used to assess knowledge, self-efficacy, family support, and medication adherence. The Chi-square test was used to analyze the data. Self-efficacy (sig=0.013; RP=2.295) and medication adherence (sig=0.014; RP=8.333) were linked to TB patients' quality of life. Knowledge (sig=0.384; RP=0.709) and family support (sig=0.227; RP=0.419) were not connected to TB patients' quality of life. In the Sleman Regency, Yogyakarta Special Region, self-efficacy and medication adherence are risk factors for quality of life among TB patients.

This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



### Corresponding Author:

Liena Sofiana

Faculty of Public Health, Universitas Ahmad Dahlan

Jalan Prof. Dr. Soepomo Janturan, Warungboto, Yogyakarta, Indonesia

Email: liena.sofiana@ikm.uad.ac.id

## 1. INTRODUCTION

Tuberculosis (TB) is a contagious illness caused by the bacteria *Mycobacterium tuberculosis* [1]. TB is a burden in many nations and is one of the top ten causes of mortality worldwide. Globally, the number of new TB cases in 2018 is estimated to be around 10 million cases, and the incidence of TB in Indonesia recorded in WHO data was 316 cases per 100,000 population and the mortality rate was 35 deaths per 100,000 population [2].

Sleman Regency is one of the districts that has the highest TB treatment success rate in DIY [3]. However, although the success rate is high, the number of TB case findings that prove to be smear positive in Sleman is still high and has continued to increase in the last three years. In 2016, the total TB cases in Sleman were 747 cases, and positive test result for acid-fast bacteria as many as 347 cases. In 2017, positive cases increased to 372 cases of acid resistant basis (*Basil tahan asam/BTA*) positive from a total of 844 cases found. Then it continued to increase to 436 positive smear cases in 2018 [4].

TB illness can have an impact on a person's quality of life in terms of physical, psychological, social, and environmental health. According to the data, 62.5% of TB patients reported a terrible quality of life [5]. Quality of life is described as a person's sense of their place in life, both in terms of cultural and

value systems where they reside and in terms of their objectives, hopes, standards, and interests throughout their lives [6]. Quality of life can affect a person's health condition, the severity of the disease, the length of treatment, and can even aggravate the condition [5].

The quality of life of TB patients is crucial to evaluate since it can impact the success of tuberculosis therapy [7]. Decreased quality of life can adversely affect the continuity of treatment being irregular or incomplete [8]. Tuberculosis treatment that is irregular or incomplete can cause resistance of tuberculosis bacteria to anti-tuberculosis drugs or called multiple drug resistance [9]. Meanwhile, people with TB who have a high quality of life have a better chance of recovering [10]. Tuberculosis patients' quality of life can be enhanced by taking anti-tuberculosis medications on a regular basis, boosting self-efficacy, and learning about the condition [11]-[13].

Self-efficacy is a person's conviction in their ability to accomplish their full potential [14]. Self-efficacy plays a significant role in influencing human behavior, including health control [15]. Several studies have found a link between self-efficacy and quality of life in TB patients [12], [13]. A good understanding will result in a willingness to respond to anything based on what is thought [16]. According to research, there is a link between the amount of knowledge and the quality of life of TB patients [17].

Previous study has revealed that family support is one of the elements that impact one's quality of life. Family support is vital in improving the quality of life of pulmonary tuberculosis patients [18]. Those with substantial family support had a 6-fold higher quality of life than patients with inadequate family support [19]. Patients who have strong family support are more motivated and enthusiastic about undergoing therapy till they recover [20].

Aside from familial support, compliance has an impact on one's quality of life. Previous research found a link between TB patients' medication adherence and their overall quality of life. The higher TB patients' drug adherence, the better their chances of effective therapy [21]. Adherence and quality of life have a one-way relationship [22].

In the previous three years, the number of case discoveries and positive smears in Sleman Regency has steadily increased. If this condition is not addressed, it will have a negative influence on many elements of life quality. According to the findings of interviews with the TB Programmer at the Health Service of Sleman Regency, there has never been an assessment of the quality of life in tuberculosis patients in Sleman Regency. The researcher conducted study on the link between self-efficacy, degree of knowledge, family support, and medication adherence to the quality of life of TB patients in Sleman Regency, Yogyakarta Special Region, Indonesia.

## 2. RESEARCH METHOD

The population in this study was all positive TB patients in the second quarter (April-June, 2020) who were still undergoing treatment in Sleman district as many as 111 people. Determination of the sample size in this study using purposive sampling technique by fulfilling predetermined criteria including being willing to become respondents, tuberculosis patients domiciled in Sleman district, age for at least 15 years. Based on these criteria, there were 52 respondents selected for this study. The instrument used in this study is a questionnaire, for measuring the quality of life using the WHO Quality of Life (WHOQOL-BREF) which is reliable, valid, and responsive and applicable across cultures. Questionnaires for the variables of knowledge (0.719), self-efficacy (0.761), family support (0.752) and medication adherence (0.773) were tested for validity and reliability using Corrected item-total correlation. Categorization of research variables using a cut off point based on the mean value. Chi square test was employed to determine the relationship between variables.

## 3. RESULTS AND DISCUSSION

### 3.1. Characteristics of the respondents

Table 1 shows the characteristics of respondents based on gender, age, education level, marital status, job status, and education level. The percentage of men and women with TB is 50 percent in this table, indicating that there is no gender difference in tuberculosis patients. The higher percentage of male patients is linked to employment situations that are more likely to cause TB bacterial infection in males, as well as the fact that men are more likely to be smokers than women. Smokers, both active and passive, can weaken their immunity, making them more prone to TB [23], [24]. Most of the respondents belonged to the productive age group, namely as many as 47 people (90.4%). At this age, humans tend to have higher mobility, thereby increasing the risk of being exposed to the germs that cause TB [19] and had a high education level of 35 people (67.3%). The level of education will also affect a person's understanding of TB disease. Thus, the lower the level of education, the risk for suffering from pulmonary TB disease will be higher [25]. The table also shows that 27 people (51.9%) have worked, jobs that allow direct contact with many people can increase

the risk of TB transmission. In addition, the type of work environment can also be a risk factor that causes respiratory infections that lead to TB. Working in a place with polluted air conditions, or with high dust exposure [21]. Most of the respondents 29 people (55.8%) have a family income level below the minimum wage; income will affect a person's behavior in maintaining his health. Income also affects a person's behavior in seeking treatment, nutrition, environment and a good healthy lifestyle [26].

Table 1. Frequency distribution of respondent's characteristics

Respondents' characteristics	Frequency (people)	Percentage (%)
<b>Gender</b>		
Male	26	50
Female	26	50
<b>Age (Year)</b>		
Non productive	5	9.6
Productive	47	90.4
<b>Education</b>		
Low (primary school, junior high school)	17	32.7
High (Senior high school, college)	35	67.3
<b>Occupational status</b>		
Working	27	51.9
Not working	25	48.1
<b>Income</b>		
Low (< minimum wage)	29	55.8
High (≥ minimum wage)	23	44.2

### 3.2. Analysis of factors related to quality of life in TB patients

Table 2 shows the association between knowledge, self-efficacy, family support, medication adherence, and quality of life in TB patients. According to Table 2, variables connected to TB patients' quality of life were self-efficacy (sig=0.013; RP=2.295) and medication adherence (sig=0.014; RP=8.333). Knowledge (sig=0.384; RP=0.709) and family support (sig=0.227; RP=0.419) were not connected to TB patients' quality of life.

Table 2. Analysis of factors related to quality of life in TB patients

Variable	Quality of life				Total		p-value	Ratio prevalence (CI 95%)
	Lacking		Good		n	%		
	n	%	n	%				
<b>Knowledge</b>								
Low	9	39.1	14	60.9	23	100	0.384	0.709 (0.387-1.300)
High	16	55.2	13	44.8	29	100		
<b>Self-efficacy</b>								
Lacking	17	68.0	8	32.0	25	100	0.013	2.295 (1.210-4.355)
Good	8	29.6	19	70.4	27	100		
<b>Family support</b>								
Lacking	7	35.0	13	65.0	20	100	0.227	0.419 (0.132-1.328)
Good	18	56.3	14	43.8	32	100		
<b>Obedience</b>								
No	11	84.6	2	15.4	13	100	0.014	8.333 (1.604-43.288)
Yes	14	35.9	25	64.1	39	100		

### 3.3. Knowledge and quality of life in tuberculosis patients

According to the findings of statistical analyses, the degree of knowledge had no significant association with the quality of life of TB patients. According to the proportion of the results, respondents with less knowledge have a decent quality of life, but respondents with a good degree of knowledge have a better quality of life. As a result, it is possible that there is no statistically significant association. This could be due to the relatively small number of respondents taken as the research sample with a heterogeneous population size of the regency area so that it could affect the results of the study. The larger the sample size, the less likely the result will be error due to sample error, the degree of population heterogeneity also affects the probability of sample error, and therefore, the more heterogeneous a population is, the larger the sample should be taken [27].

Another reason for the lack of a relationship between the level of knowledge and the quality of life of tuberculosis patients may be that the sampling method used, a questionnaire, allows the quality of the

answer to be dependent on the honesty of the respondent, allowing bias to occur based on the respondent's answer. The weakness of using questionnaires is that respondents are often not accurate in their answers so that something is overlooked, sometimes respondents deliberately give dishonest answers [28].

This study supports earlier findings that there is no association between knowledge level and quality of life [29]. The lack of a link between knowledge and quality of life might be due to patients' knowledge being about TB disease rather than particular information about the quality of life that TB patients must do. Respondents who do not have specific knowledge cannot identify what kind of care activities should and should be done [30]. Someone who has broader knowledge can control himself in overcoming the problems faced and can shape the quality of life [18].

#### **3.4. Self-efficacy and quality of life in tuberculosis patients**

The results of statistical tests showed that quality of life had a significant relationship with tuberculosis patient self-efficacy. Self-efficacy in both patients is influenced by the characteristics of patients who are mostly well-informed (55.8%) and the level of higher education (67.3%) which causes easy absorption of information by patients. Knowledge is an important factor in the formation of self-efficacy because knowledge is used by individuals as a basis for making attitudes and behavior [31]. Other factors that can affect self-efficacy are experience of mastering something, social persuasion, education level, physical and emotional conditions. Most of the research respondents were of productive age (90.4%) and had jobs (51.9%). This makes it easier for patients to socialize with others and obtain additional information regarding their illness, as well as get emotional support [32].

Patients with high self-efficacy are more likely to complete their therapy, which improves their quality of life, and vice versa. In a number of settings, self-efficacy is effective in predicting health behavior and quality of life. Adherence (taking medicine), health behavior (physical activity), successful pain management, and disease management can all be predicted by self-efficacy [33].

Self-efficacy refers to a person's conviction in his own talents and how they may change his life. Self-efficacy governs how an individual feels, thinks, motivates himself, and behaves [34]. The self-efficacy of a tuberculosis patient affects the ability to access health services, the belief is that they have enough money for medical treatment, the ability to use a vehicle and the belief that they have enough time to carry out health checks at health services [35]. Previous research has also found a close and favorable association between self-efficacy and quality of life in TB patients [36]. Those with high self-efficacy have a 5,850 times greater likelihood of having a higher quality of life than those with low self-efficacy [36].

#### **3.5. Family support and quality of life in tuberculosis patients**

Family support is an attitude and behavior that occurs as a result of a family's response to family members. Family assistance might take the form of information, evaluation, instrumental support, or emotional support [37]. Family support is also defined as the most important element to help someone solve problems. The existence of family support makes a person have a higher self-confidence and motivation to face any problems [38].

The Chi-square test findings suggest that there is no statistically significant link between family support and TB patient quality of life. The findings of this study contradict those of a previous study done in Puskesmas Paraman Ampalu in West Pasaman Regency. The findings of this study suggested a link between family support and quality of life in individuals with pulmonary tuberculosis [39]. Other research has found that patients with strong family support are six times more likely to have a decent quality of life than patients with weak family support [19].

However, the findings of this study did not show a link between family support and TB patients' quality of life. Researchers think that family support has a role in influencing patients' quality of life. The family serves as a support system or a support system for other ill family members [40]. The importance of family support in the healing of TB patients cannot be overstated. The presence of adequate family support would improve the quality of life of TB patients. As a result, an improvement in TB patients' quality of life will have an effect on their overall health [5].

Family is the person closest to the suffering and most understands his or her illness. When a family member becomes unwell, other family members will undoubtedly give positive support to help the suffering recover. The sense of empathy that is owned in the family towards fellow members tends to be higher than that of others. With high empathy, it will encourage families to provide full support for anyone who is sick in their family [41].

The family role referred to in this case is the family behavior in providing care to family members who suffer from TB disease. For example, being a supervisor when a patient is taking medication, providing nutritious foods. Family also has a role to provide enthusiasm or motivation to undergo treatment, pay attention to personal hygiene and environmental cleanliness around the patient and the like [42].

Family support, both social, emotional, rewarding, instrumental and informative support, has a direct relationship with a person's quality of life. The better the family support, the better the patient's quality of life will be. Vice versa, the worse the family support provided, the more likely the patient will have a lower quality of life [20].

### 3.6. Medication adherence and quality of life in tuberculosis patients

Adherence is a term to describe the patient's behavior in swallowing the drug correctly according to the dose, frequency, and time [43]. The behavior of pulmonary TB patients in taking medicine requires direct supervision by the drug taking supervisor (PMO). This is done to reduce patient neglect in carrying out the treatment process and reduce the risk of treatment failure [44].

The chi square test findings revealed a strong link between medication adherence and quality of life in TB patients. This finding is consistent with the findings of a study done at the (Multi-Drug Resistant Tuberculosis) MDR-TB Polyclinic hospital Arifin Ahmad Pekanbaru. According to this study, the sig=0.037 (0.05). That example, among TB patients, there is a large and unidirectional link between adherence and quality of life. Those with high levels of adherence have a 5,000-fold higher quality of life than patients with poor levels of adherence [21].

Based on the research results, it is known that most of the respondents were new tuberculosis sufferers or were still in the early phase of treatment. In the initial phase of treatment, patients tend to have high adherence. In the early phase of treatment, the patient was enthusiastic and still disciplined in carrying out the treatment. In addition, in the early phase of treatment, the side effects caused by the drugs that are consumed have not been felt or have not caused disturbances [21].

Patients who did not adhere the treatment had a greater risk of experiencing treatment failure. If the patient is not compliant, the treatment process will return from the beginning and become longer. The longer the treatment, the side effects that arise due to treatment will be more frequent and can become more severe [5]. The side effects of TB medications might produce changes in responders, including alterations in the aspects of quality of life, including physical, psychological, environmental, and social interrelationships [21].

Because they are still in the early phases of therapy, participants in this research may not have encountered any disruptions or side effects from the treatment process that might influence the patient's quality of life. As a result, it may be inferred that the patient has a high quality of life in terms of physical, psychological, environmental, and social factors. This study's findings also revealed a link between medication adherence and TB patients' quality of life. This suggests that the higher the level of drug adherence, the better the quality of life for TB patients, and vice versa.

The findings of this study contradict those of previous studies conducted at the Summersari Health Center in Jember Regency. The findings revealed p-value of 0.44 and r-value of 0.12. This suggested that there is no association between medication adherence and quality of life in patients with pulmonary TB, and the relationship between variables is very weak [44].

## 4. CONCLUSION

Self-efficacy and medication adherence were factors connected to TB patients' quality of life, while knowledge and family support were factors unrelated to TB patients' quality of life. Patients are likely to be able to obtain further TB information. Patients are expected to have the confidence to recover by regularly taking medication and doing positive things such as exercising. The patient's family is expected to play an active role as a companion or supervisor of taking medication (called in Indonesia *Pengawas Menelan Obat/PMO*) while the patient is undergoing the treatment process.

## ACKNOWLEDGEMENTS




We would like to thank Universitas Ahmad Dahlan for providing research funding, as well as public health center and the Sleman District Health Office for supporting this study.

## REFERENCES




- [1] WHO, *Global tuberculosis report*. Geneva: World Health Organization, 2018.
- [2] WHO, *Global tuberculosis report*. Geneva: World Health Organization, 2019.
- [3] Health Office of Daerah Istimewa Yogyakarta, *Health Profile of the Special Region of Yogyakarta in 2017*. Yogyakarta: Dinas Kesehatan DIY, 2018.
- [4] Health Office of Sleman District, *Health Profile of Sleman Districtin 2019*. 2019.
- [5] M. Suriya, "Factors Associated with Quality of Life of Pulmonary TB Patients at Lubuk Alung Special Hospital, West Sumatra," *Jurnal Keperawatan Abdurrah*, vol. 2, no. 1, pp. 29–38, 2018.

- [6] WHO, "WHOQOL measuring quality of life," World Health Organization, 1997.
- [7] L. Nordenfelt, *Concepts and measurement of quality of life in health Care*. Netherland: Kluwer Academic Publishers, 2013.
- [8] N. Y. Ratnasari, "The relationship of social support with quality of life in patients with pulmonary tb at the center for pulmonary disease treatment (BP4) Yogyakarta Minggirani Unit," *Jurnal Tuberkulosis Indonesian*, vol. 8, no. 2, pp. 1–35, 2012.
- [9] Kementerian Kesehatan RI, *Tuberculosis control national guidebook*. Jakarta: Kementerian Kesehatan RI, 2014.
- [10] N. M. Mertaniasih, E. B. Koendhori, and D. Kusumaningrum, "Microbiological diagnostic tuberculosis textbook," Surabaya: Airlangga University Press, pp. 35–36, 2013.
- [11] M. Ardiansyah, "Medical Surgery for Students," Yogyakarta: Diva Press, 2012.
- [12] M. F. Tambunan, "Relationship of self-efficacy with quality of life of pulmonary tuberculosis patients at Haji Adam Malik General Hospital Medan in 2013," Thesis, Universitas Sumatera Utara, 2014.
- [13] H. T. Andriana, "Factors associated with quality of life of pulmonary tuberculosis patients at the community lung health center (BKPM) Semarang," Thesis, Universitas Islam Sultan Agung, 2016.
- [14] A. F. Helmi, C. L. Rembulan, and A. Reginasari, *Psychology for Indonesia: current issues of social relations from interpersonal to interorganization*. Yogyakarta: Gadjah Mada University, 2020.
- [15] F. Sedjati, "The relationship between self-efficacy and social support with the meaning of life in patients with pulmonary tuberculosis at the lung disease treatment center (BP4) Yogyakarta," *Empathy Jurnal Fakultas Psikology*, vol. 2, no. 1, p. 16, 2013.
- [16] Budiman and A. Riyanto, *Knowledge and attitude in health research*. Jakarta: Salemba Medika, 2013.
- [17] A. N. Saputri, "Relationship of knowledge level about tuberculosis with quality of life of pulmonary tuberculosis patients in the working area of lempake health center Samarinda," Thesis, Universitas Muhammadiyah Kalimantan Timur, 2018.
- [18] I. Abrori and R. A. Ahmad, "Quality of life of patients with drug-resistant tuberculosis in Banyumas district," *Berita Kedokteran Masyarakat*, vol. 34, no. 2, pp. 56–61, 2018.
- [19] D. Jasmianti, K. Darwin, and N. Huda, "Relationship between family support and quality of life in pulmonary TB patients," *Journal Ners Indonesian*, vol. 7, no. 2, pp. 20–29, 2017.
- [20] M. P. Terok, J. Bawotong, and F. M. Untu, "The relationship of social support with quality of life in pulmonary tuberculosis patients at the Lung Poly BLU RSUP DR. R.D. Kandou Manado," *Jurnal Keperawatan*, vol. 1, no. 1, pp. 1–47, 2012, doi: 10.19641/j.cnki.42-1290/f.2012.03.022.
- [21] D. P. Sari, D. Karim, and J. Ernawaty, "Relationship between adherence to medication and quality of life for MDR TB patients at the MDR TB polyclinic, Arifin Ahmad Hospital Pekanbaru," *Jurnal Online Mahasiswa Universitas Riau*, vol. 5, pp. 105–114, 2016.
- [22] R. Marchiella, "Evaluation of knowledge, compliance and quality of life of pulmonary tuberculosis patients at Padang Bulan Health Center, Medan Baru District, North Sumatra," Thesis, Universitas Sumatera Utara, 2018.
- [23] A. N. Saputri and S. K. Muflihatin, "The relationship between knowledge level about tuberculosis and quality of life of tuberculosis patients in the working area of the Lempake Community Health Center, Samarinda," Thesis, Universitas Muhammadiyah Kalimantan Timur, 2018.
- [24] F. Tandang, A. L. A. Amat, and P. D. Pagan, "The Relationship of Smoking Habits in Active and Passive Smokers with the Incidence of Pulmonary Tuberculosis at the Sikumana Health Center, Kupang City," *Cendana Medical Journal*, vol. 15, no. 3, pp. 382–390, 2018.
- [25] D. Namuwali, "Demographic characteristics and Quality of life of pulmonary TB patients at Waingapu Health Center, East Sumba," *Jurnal Penelitian Kesehatatan Suara Forikes*, vol. 10, no. April, pp. 129–134, 2019.
- [26] Rosdiana et al., "Implementation of the chronic disease management program (Prolanis)," *Higeia Journal of Public Health Research and Development*, vol. 1, no. 3, pp. 140–150, 2017.
- [27] I. Nurdin and S. Hartati, *Social research methodology*. Surabaya: Media Sahabat Cendekia, 2019.
- [28] S. Arikunto, *Research procedure: a practical approach*. Jakarta: Rineka Cipta, 2016.
- [29] S. Chapagai, G. R. Andrews, and N. Naik, "A study to assess the knowledge and quality of life of pacemaker patients with a view to develop an information booklet," *International Journal of Educational Research*, vol. 7, no. 1, p. 108, 2017, doi: 10.5958/2349-2996.2017.00022.2.
- [30] N. P. W. P. Sari, "Diabetes mellitus: the relationship between sensory knowledge, self-awareness, self-care actions and quality of life," *Journal Ners Lentera*, vol. 4, no. 1, pp. 51–59, 2016.
- [31] E. Herawati, "The relationship between knowledge and self-efficacy of pulmonary tuberculosis patients at the Surakarta community pulmonary health center," Fakultas Ilmu Kesehatan Universitas Muhammadiyah Surakarta, 2015.
- [32] J. Feist and G. F. Feist, *Personality Theory (Seventh Edition)*. Jakarta: Salemba Humanika, 2010.
- [33] J. M. Cramm, M. H. H. Strating, M. E. Roebroek, and A. P. Nieboer, "The Importance of General Self-Efficacy for the Quality of Life of Adolescents with Chronic Conditions," *Social Indicators Research*, vol. 113, no. 1, pp. 551–561, 2013, doi: 10.1007/s11205-012-0110-0.
- [34] N. Hidayah and A. Atmoko, *Socio-cultural and psychological foundation*. Malang: Penerbit Gunung Samudera, 2014.
- [35] Ahmadi and A. R. Hakim, "Self-efficacy and selected demographics as determinants of the family behavior on examination for patients with tuberculosis in Pamekasan," *Jurnal Kerta Cendekia*, vol. 1, no. 1, pp. 122–132, 2019.
- [36] S. Yunita, "The Relationship of Self-Efficacy with Quality of Life in Patients with Pulmonary TB at the Pulmonary Polyclinic, Dr. Mohammad Saleh, Probolinggo City," Nursing Science Study Program, Majapahit College of Health Sciences, 2019.
- [37] Yusran Hasyim, *Family Support and Initiation on Perception of Pain Level in Myocardial Infarction Patients (IMA)*. Malang: CV IRDH, 2019.
- [38] M. Friedman, *Family Nursing Textbook : Riset, Teori dan Praktek Edisi ke-5*. Jakarta: EGC, 2010.
- [39] N. Saadah, R. Ningsih, and E. Haskar, "Relationship between family support and quality of life of pulmonary TB patients," *Jurnal Menara Medika*, vol. 1, no. 2, pp. 79–85, 2019.
- [40] M. H. Putri, "Family support as an important factor in drug compliance in pulmonary tuberculosis patients," *Wellness Health Magazine*, vol. 2, no. February, pp. 127–134, 2020.
- [41] A. S. A. Susilo, "Determinant factors affecting the quality of life of tuberculosis patients at the pulmonary Hospital dr. Ario Wirawan Salatiga," Fakultas Ilmu Kesehatan Universitas Muhammad Surakarta, 2018.
- [42] Risdayani, H. Bahar, and F. N. G., "Qualitative analysis of the role of the family in caring for family members suffering from pulmonary tuberculosis in the work area of the Poasia Health Center, Kendari City in 2016," *Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat*, vol. 1, no. 4, pp. 1–15, 2016.
- [43] Nursalam and N. D. Kurniawati, *Nursing Care for HIV/AIDS-Infected Patients*. Jakarta: Salemba Medika, 2007.
- [44] D. V. Ariani, S. Warsini, and I. Rahmat, "Relationship Between Spiritual Faith and Quality of Life of Post-Earthquake Victims in Bantul Regency, Yogyakarta," *Jurnal Ilmu Keperawatan*, vol. 4, no. 2, 2009.




**BIOGRAPHIES OF AUTHORS**

**Liena Sofiana**    is a lecturer at the Faculty of Public Health, Universitas Ahmad Dahlan, Indonesia. She is a Ph.D. Candidate in Public Health, Universitas Diponegoro, Indonesia. Her area of expertise are epidemiology, communicable and non-communicable diseases, helminthiasis, tuberculosis, juvenile delinquency, and health epidemiology services and Healthcare Associated Infection (HAIs). She can be contacted at email: [liena.sofiana@ikm.uad.ac.id](mailto:liena.sofiana@ikm.uad.ac.id).






**Suci Musvita Ayu**    is a lecturer at the Faculty of Public Health, Universitas Ahmad Dahlan, Indonesia. She is a Ph.D. Candidate in Public Health, Universitas Diponegoro, Indonesia. Her area of expertise are dating violence, reproductive health for adolescent, and breastfeeding. She can be contacted at email: [suci.ayu@ikm.uad.ac.id](mailto:suci.ayu@ikm.uad.ac.id).






**Yuniar Wardani**    is a Ph.D. candidate at the School of Public Health, College of Public Health, Taipei Medical University, Taipei, Taiwan. Currently, she is a lecturer at Faculty of Public Health, Universitas Ahmad Dahlan, Indonesia. Her research interest is maternal and child health. She can be contacted at email: [yuniar.wardani@ikm.uad.ac.id](mailto:yuniar.wardani@ikm.uad.ac.id); [yuniar.wardani@gmail.com](mailto:yuniar.wardani@gmail.com).



**Evelyn Puspaningrum**    is a student at the public health study program, faculty of public health, Ahmad Dahlan University, Indonesia. His research interest and focus is in the field of epidemiology. She can be contacted at email: [evelyn.puspa25@gmail.com](mailto:evelyn.puspa25@gmail.com).



**Dinda Dwi Hadiani**    is a student at the public health study program, faculty of public health, Ahmad Dahlan University, Indonesia. His research interest and focus is in the field of epidemiology. She can be contacted at email: [dindadh@gmail.com](mailto:dindadh@gmail.com).