Factors Affecting Tuberculosis Patients’ Quality of Life in Surabaya, Indonesia

Ni Njoman Juliusiuh1
Ni Made Mertaniash2
Cholichul Hadi3
Soedarsono4
Reny Mareta Sari1
Ilham Nur Alfian5

1Laboratory of Tuberculosis, Institute of Tropical Disease, Universitas Airlangga, Surabaya, Indonesia; 2Department of Medical Microbiology, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia; 3Department of Industrial and Organizational Psychology, Faculty of Psychology, Universitas Airlangga, Surabaya, Indonesia; 4Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Airlangga, Surabaya, East Java, Indonesia; 5Department of Personality and Social Psychology, Faculty of Psychology, Universitas Airlangga, Surabaya, Indonesia

Purpose: Patients with tuberculosis need to religiously take medication daily. However, they experience several side effects from these medications. The main reason for measuring the quality of life is to explain closely related factors that affect the patient’s daily life that have been compromised with illness, while considering a patients’ well-being that has associations with individual characteristics.

Patients and Methods: This study included 157 patients with tuberculosis at 5 primary health-care centers and 2 hospitals in Surabaya. Quality of life is determined based on eight domains: general health, pain, social functioning, physical functioning, role limitation due to physical health, role limitation due to emotional problems, energy, and emotional well-being. The research instrument used to measure the quality of life is the RAND-36 Item Health Survey, whereas that used to measure mental distress is the Self-Reporting Questionnaire.

Results: Our study results show that, of the eight domains measuring the quality of life, only age exhibited a significant effect on general health (P = 0.018); sex did not significantly affect the quality of life in all domains. The level of education exhibited a significant effect only on role limitation due to emotional problems (P = 0.014). Mental distress demonstrated a significant effect on the quality of life in all domains.

Conclusion: There are several factors affecting TB patients’ quality of life. The study found that age, level of education, and comorbidity affect quality of life in several domains. However, mental distress affects quality of life in all domains.

Keywords: demographic variables, mental distress, quality of life, tuberculosis

Introduction

Tuberculosis (TB) remains a major challenge in the health sector.1 In Indonesia, its prevalence in 2018 was 321 per 100,000 people.2 The Ministry of Health has set targets for the National TB Control Program to reduce morbidity by 80% in 2030 and 90% in 2035 and to reduce mortality by 90% in 2030 and 95% in 2035. The duration of TB treatment and the side effects that arise influence the daily life of TB patients, which then affects their quality of life.3–6

The World Health Organization defined quality of life as an individual’s perception of his/her position in life within the cultural context and value system in how they live. Quality of life is also related to one’s goals, hopes, standards, and concerns.7 In addition, it refers to an individual’s assessment of his/her satisfaction and meaningfulness in living life.8

There are several factors that affect the quality of life of TB patients, including social support, medical factors, psychological factors, demographic factors, and educational and counseling programs.9 TB patients tend to have poor quality of life and
a high risk of experiencing depression. Quality of life can also affect a TB patient’s adherence to treatment. Social support, age, and education contribute to the quality of life of TB patients.

The quality of life of TB patients is related to psychological domain, environmental conditions, social relationships, and physical conditions (physical domain). Quality of life is also closely connected to psychological and environmental conditions. Age, sex, income, and duration of treatment variables affect the psychological condition aspects of quality of life. Social relations and environmental conditions are only affected by income and treatment duration. The results of the research conducted by Dawar et al on 100 TB patients in 2016 revealed that 32 of the patients were diagnosed with major depressive disorder, including 7 with mild depression, 20 with moderate depression, and 5 with severe depression. The variables that affect the quality of life in the physical condition aspects are income, treatment duration, and employment status.

There are several factors, such as sex, age, marital status, educational level, employment status, monthly income, chronic illness, and body mass index, that significantly affect a person’s quality of life. The research conducted by Salodia, Sethi, and Khokhar in 2019 demonstrated that 23.6% of TB patients experience depression. The main reason for measuring the quality of life is to explain closely related factors that affect a patient’s daily life that have been compromised with illness, while considering a patients’ well-being that has associations with individual characteristics.

**Patients and Methods**

The current study was conducted as observational research using a cross-sectional approach. A total of 157 TB patients from 5 primary health-care centers and 2 hospitals were included in the study. The sample were all TB patients chosen randomly based on data given by primary health-care centers and hospitals excluding pregnant women and children. The study was approved by the Ethics Committee in Health Research of Dr. Soetomo Hospital with ethical clearance number 1636/KEPK/XI/2019 and was approved on 9 September 2019. The study was non-intervention research, data were obtained by interviewing TB patients as respondents. Before the interview, the respondents were given an explanation of the research and publications to be carried out. All respondents information is kept confidential and only used for research purposes. After getting an explanation, the respondent is allowed to refuse the interview or resign in the middle of the interview. The respondents gave their written consent and permission for publication of the letters and to participate in the research. We confirm that all the research meets the ethical guidelines and has been submitted to the ethics committee.

Quality of life is determined based on eight domains: general health, pain, social functioning, physical functioning, role limitation due to physical health, role limitation due to emotional problems, energy, and emotional well-being. Quality of life was measured using the RAND 36-item health survey. Table 1 contains an explanation of the domains from the RAND 36-Item Health Survey.

Every domain was scored from 0 to 100. The higher score equating to the better quality of life in every domain. In general health, the higher score showed the better health status. In domain pain the higher score showed that there is less pain and how pain did not affect daily activities. The higher score in social functioning and physical functioning showed that there is no limitation in doing social activities and daily activities. In role limitation due to physical health and role limitation due to emotional problem, the higher score showed that there is no limitation in doing daily activities. In domain energy, the higher score means the more energy or less fatigue they have. In domain emotional well-being, the higher score means the absence of feeling sad or nervousness.

The independent variables that were considered were sex, age, level of education, comorbidities, mental distress, and...
working status, monthly income, and body mass index (BMI). Age variables were classified based on the recommendations of the Ministry of Health in Indonesia: teenagers (15–25 y), young adults (26–35 y), late adults (36–45 y), early elderly (46–55 y), middle elderly (56–65 y), and late elderly (>65 y). Comorbidities were considered when TB patients were diagnosed with other illnesses in addition to TB. Mental distress variables were measured using the Self-Reporting Questionnaire. Scores were then categorized into a probable non-case (score ≤ 7) and/or probable case (score ≥ 8). Working status was categorized as working and not working. Respondents who classified as not working are housewife, student, and people who do not have a job. Body mass index (BMI) was categorized, based on the Indonesian Ministry of Health, into severely underweight (BMI < 17.0); light underweight (BMI = 17.0–18.4); normal weight (BMI = 18.5–25.0); light overweight (BMI = 25.1–27.0); and severely overweight (BMI > 27.0). Statistical analysis was conducted using the General Linear Model with a set at 0.05 to analyze the determinants of quality of life.

Results

Table 2 shows the characteristics of the respondents, including sex, age, educational level, comorbidities, and mental distress.

Table 2 indicates that some respondents were female. The age groups of teenagers (23.6%) and late adults (22.3%) had the highest numbers of respondents, and the highest level of education was senior high school (47.1%). As many as 63.7% of TB patients did not exhibit comorbidity, and 36.9% were suspected of having mental distress. Most of the respondents had a monthly income less than IDR 500,000. The large number of respondents who had low monthly income can be caused by the high number of respondents who do not work (46.5%). Body mass index of TB patients ranged from severely underweight to severely overweight. Most of the respondents had a normal BMI. However, there are 22.3% who were severely underweight and 12.7% who were overweight. It can be seen that TB patients tend to be severely underweight to normal BMI.

Quality of life consists of eight domains: general health, pain, social functioning, physical functioning, role limitation due to physical health, role limitation due to emotional problems, energy, and emotional well-being. In every domain, the higher score means the better quality of life the respondent have.

Table 3 indicates that the physical functioning domain has the highest average value (70.97) and it means that generally the respondents had good physical function and there is no limitation in doing daily activities. Role limitation due to physical health domain has the lowest average
Table 3 Quality of Life of Patients with Tuberculosis

| Dependent Variable | Domain                        | Minimum | Maximum | Mean   | Standard Deviation |
|--------------------|-------------------------------|---------|---------|--------|--------------------|
| Quality of life    | General health                | 20      | 95      | 63.67  | 17.184             |
|                    | Pain                          | 0       | 100     | 55.22  | 29.019             |
|                    | Social functioning            | 0       | 100     | 70.70  | 26.468             |
|                    | Physical functioning          | 0       | 100     | 70.97  | 24.004             |
|                    | Role limitation due to physical health | 0     | 100     | 36.78  | 41.753             |
|                    | Role limitation due to emotional problems | 0    | 100     | 48.30  | 43.379             |
|                    | Energy                        | 10      | 90      | 59.60  | 18.322             |
|                    | Emotional well-being          | 16      | 88      | 65.77  | 16.450             |

value (36.78). It means that generally the respondents’ physical health tended to affect their daily activities.

Table 4 indicates that sex did not significantly affect quality of life, and only age significantly affected the general health domain ($P = 0.018$). The level of education significantly affected the physical functioning domain ($P = 0.016$) and role limitation due to physical health ($P = 0.020$). Comorbidity had a significant effect on general health ($P = 0.029$), pain ($P = 0.026$), physical functioning ($P = 0.012$), role limitation due to physical health ($P = 0.001$), and role limitation due to emotional problems ($P = 0.024$).

Moreover, mental distress significantly affected the quality of life of TB patients in all domains. Working status, monthly income, and BMI did not affect quality of life in every domain.

Discussion

Patients with TB had a lower quality of life in all domains compared with healthy people. Some research results revealed that sex does not affect the quality of life of TB patients. Quality of life is influenced by various factors, including education, employment status, and income. In Indonesia, both men and women have the same rights in obtaining education and employment. The number of health facilities in Indonesia continues to increase, and TB patients in larger cities have easy access to facilities. No one should be discriminated against, especially when obtaining health services, social facilities, and equal opportunities. As no differences were observed in obtaining education, employment, or access to health facilities, both men and women can achieve an equal quality of life.

Age influences general health because, as people age, their health conditions decline in general. Older people are less likely to maintain their diet and health conditions. Age did not influence any of the other domains, because older people can overcome and adjust to these conditions and thus feel that they do not experience obstacles in running their daily lives.

The results revealed that the level of education affected the quality of life in role limitation due to emotional

Table 4 P-Value of Factors Affecting the Quality of Life of TB Patients

| Factors               | General Health | Pain | Social Functioning | Physical Functioning | Role Limitation due to Physical Health | Role Limitation due to Emotional Problems | Energy | Emotional Well-Being |
|-----------------------|----------------|------|--------------------|----------------------|----------------------------------------|-------------------------------------------|--------|----------------------|
| Sex                   | 0.406          | 0.248| 0.426              | 0.181                | 0.346                                  | 0.297                                     | 0.427  | 0.097                |
| Age                   | 0.018*         | 0.551| 0.262              | 0.093                | 0.227                                  | 0.306                                     | 0.403  | 0.238                |
| Educational level     | 0.300          | 0.139| 0.163              | 0.016*               | 0.120                                  | 0.020*                                    | 0.273  | 0.408                |
| Comorbidity           | 0.029*         | 0.026*| 0.161             | 0.012*               | 0.001*                                 | 0.024*                                    | 0.360  | 0.964                |
| Mental distress       | 0.001*         | 0.001*| 0.001*            | 0.001*               | 0.004*                                 | 0.001*                                    | 0.302  | 0.838                |
| Working status        | 0.183          | 0.441| 0.560              | 0.201                | 0.763                                  | 0.408                                     | 0.343  | 0.260                |
| Monthly income        | 0.841          | 0.806| 0.363              | 0.212                | 0.789                                  | 0.097                                     | 0.343  | 0.848                |
| BMI                   | 0.523          | 0.802| 0.537              | 0.965                | 0.900                                  | 0.713                                     | 0.848  | 0.470                |

Note: *Significantly affects quality of life.
problems. Educational level was a strong predictor of quality of life. An individual who has a higher education more easily receives new information. The ability to receive information has an impact on one’s way of thinking, including the ability to overcome problems, such as emotional issues. Individuals with a higher education tend to have more knowledge and, thus, find ways to overcome problems as they have fundamental knowledge, reasoning abilities, emotional self-regulation, and interactional abilities. Thus, the level of education can improve one’s ability to overcome limitations due to emotional problems. One study has reported that emotions are closely related to ways of thinking and solving problems.

The presence of comorbidities results in TB patients experiencing more symptoms and pain, aside from TB itself. The number of symptoms experienced by patients affects their quality of life. The decline in physical condition and the increase in the number of chronic symptoms are closely related to mental distress, which can have an impact on quality of life.

The prevalence of depression in TB patients is higher than in the general population. Mental distress among TB patients can affect their health conditions and quality of life, finding which is similar to our research result. Poor quality of life is often experienced by people with mental distress. This is in line with the research by Uddin et al who stated that an individual without mental distress has a better quality of life.

**Conclusion**

Sex does not significantly influence the quality of life of TB patients, and age only affects the general health domain. Moreover, the level of education affects physical functioning and role limitation due to emotional problems. Comorbidity affects several domains, namely, general health, pain, physical functioning, role limitation due to physical health, and role limitation due to emotional problems. Mental distress has a significant effect on quality of life in all domains.

Future study is warranted to investigate the implementation of practices to improve quality of life factors for effective TB patient care with optimal clinical outcomes. Management of TB patients should include the implementation of care to support the quality of life factors in addition to increased patient immunity and appropriate anti-TB drug therapy.

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**Disclosure**

The authors declare no conflicts of interest.

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