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Factors Related To Treatment Coverage Of Lung Tuberculosis In Timor Island

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INFORMASI

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ABSTRACT

Background: Treatment coverage (TC) of Tuberculosis (TB) as indicator of TB is the main cause of death from infectious agents throughout the world. WHO has set 2030 as the end of TB, but treatment coverage in several countries is still low. Of all provinces in Indonesia, East Nusa Tenggara is the third lowest province with 40.1% coverage. On the Timor mainland, there are 3 districts with treatment coverage achievements below the national indicator (90%), namely South Central Timor District (43%), North Central East District (46%), and Belu District (71%). This condition will have an impact on achieving end TB by 2030. Several factors that may be the cause of the low contribution of treatment coverage include poverty, the ratio of community health centers/auxiliary health centers/pustu to sub-districts/population, motivation of TB program managers, availability of health insurance, cross-sectoral collaboration and TB management at the border.

Objective: This research aims to determine the factors that contribute to the low achievement of treatment coverage.

Method: the research used was quantitative study with cross sectional design.

Result: the average age of respondents was 38,83 years (SD = 5,84), the average length of work of respondents was 10,87 (SD = 7.55). More than half, namely 66,3%, had a Diploma Nursing education. More of the three quarters of respondents, 75,9% were married. Nearly all patients were civil servants/ P3K (94%). Most of the TB patients were from poor families (68,7%); all managers did not feel that there was cross-sectoral collaboration (94,0%). Only motivation that had significant relationship with TC.

BACKGROUND

Tuberculosis (TB) is the main cause of death from infectious agents and one of the 10 highest causes of death in the world. Globally, it is estimated that 10.6 million (range 9.8-11.3 million) people are sick with TB; 1.4 million (range 1.3-1.5 million) deaths due to TB (WHO, 2023). Indonesia has a TB incidence of 969,000 cases (354 per 100,000 population); with the second largest position after India. Meanwhile, data from BPS East Nusa Tenggara (NTT) province shows the number of TB cases is 6,583 (Kemenkes, 2023). For mainland Timor, the most cases were found in Belu Regency (668), South Central Timor (497), Kupang City (461) and Malacca 415 (Dinkes NTT, 2024).

Tuberculosis case detection coverage (treatment coverage) is the number of tuberculosis cases found among the estimated tuberculosis cases (Ministry of Health report). TB treatment coverage in 2022 will be 74.7% of the target of 90%. This report was obtained from the Tuberculosis Information System (SITB) and WIFI TB, a system built to facilitate TB reporting. Data per province shows that the lowest treatment coverage is in 3 provinces, namely NTT, Jambi and Bali. NTT's treatment coverage is 40.1% (Kemenkes, 2023). On the mainland of Timor, as one of the largest islands in NTT, the districts/cities with the highest number of TB discoveries but treatment coverage is still below the national indicator are Belu District (71% TB cases), TTU (46%) and TTS (43%) (Dinkes NTT, 2024).

Mainland Timor, as part of NTT Province, has its own challenges in handling TB. This is because infrastructure development has not been evenly distributed in the NTT area, especially for road access and health facilities and human resources in remote areas. Apart from that, the high poverty rate also contributes to the emergence of various diseases, such as TB. The fact on the ground is that many people in NTT have conditions in their homes that are far from healthy. Such as not having sufficient ventilation, not being exposed to sunlight, houses that are close to cages and not having public toilets, and a tendency to hang dirty clothes. Difficulty in water sources also contributes to disease because it will be difficult to wash hands and other basic needs.

Factors that contribute to treatment coverage include accessibility to health services, availability of supporting infrastructure for TB diagnostic examinations in health facilities, socio-economic conditions, and geographical characteristics (European Centre for Disease Prevention and Control, 2014). Apart from that, the high level of poverty, social and cultural characteristics of the people in Mainland Timor also influence TB control efforts (Deristo, 2021). Stigma towards TB remains a serious problem, which can prevent individuals from seeking early care or adhering to appropriate treatment regimens. These factors collectively create an environment that is not conducive to effective TB control efforts. This study objective was to determine the factors that contribute to the low achievement of treatment coverage in Timor island, East Nusa Tenggara Province.

METHOD

Study design

This research used quantitative method with crosssectional approach. The population of this study were TB managers.

Sample

The sampling technique in this study used total sampling. A total of 83 TB managers from four districts in Timor island who have many cases of TB or the TC was still below national target. The 4 district are Belu Regency South Central Timor), Kupang City and Malaccawere who participate in this research. Research variables consist of demographic data (age, length of work, education, marital status), poverty factors of patients, National Health Insurance/NHI (BPJS) participation, cross-sectoral involvement and manager motivation.

Instrument

The instrument used were demographic data and The Multidimensional Work Motivation Scale (MWMS) questionnaire to assess the motivation of TB program managers. The Multidimensional Work Motivation Scale (Gagné et al., 2015) was developed by Several researchers from various countries such as Australia, Canada, Belgium, Norway, Zurich, Indonesia, France, United Kingdom and Senegal. The MWMS, validated in seven languages commonly used instrument for measuring work motivation. This 19-item scale assesses the five types of regulation proposed by Self Determination Theory (SDT): amotivation, external, introjected, and identified regulation, as well as intrinsic motivation. Confirmatory factor analysis (CFA) chosen to validate this instrument using Akaike's information criterion model (AIC). Standardized pattern coefficients ranged from .48 to .96 across the France, English and Dutch. Correlations between the latent variables ranged from –.45 to .82, from –.53 to .80, and from –.38 to .75 in the French, English, and

Dutch samples, respectively. CFAs on the Norwegian, Indonesian, German and Chinese showed that the AIC model was acceptable. The instrument also have been provided test of reliability based on Cronbach Alpha value. The Cronbach Alpha of the MWMS was 0.800.

Data Collection

The research was conducted from July-October 2024 in 83 Public Health Centers in Timor island.

Data Analysis

Descriptive statistics were used to summarize respondent characteristics, including age, length of work, duration as a TB manager, motivation, economic status of TB sufferers' families, National Health Insurance (NHI) status, and intersectoral collaboration. Data were presented in frequencies percentages, means, and standard deviations were used to summarize the data.

Since most variables were measured on an ordinal scale and did not meet the assumptions of normality, non-parametric tests were used. The association between independent variables and the dependent variable—treatment coverage (TC)—was examined using the Spearman's rank correlation test of association as appropriate. The level of statistical significance was set at $p < 0.05$.

Ethical Consideration

Ethical approval for this research was granted under No. 097/KEPPKSTIKSC/VII/2024 from STIK Carolus, Jakarta. All procedures performed in the study were in accordance with the ethical standards of the institutional research committee and the 1964 Helsinki Declaration and its later amendments. Prior to data collection, written informed consent was obtained from all participants after explaining the study objectives, procedures, confidentiality assurances, and their right to withdraw at any time without consequences. Data were anonymized and used solely for research purposes.

RESULT

The research results are described in the table below:

Table 1 above shows that the average age of respondents is 38.83 years (SD = 5.84) with the youngest being 27 years and the oldest 54 years. The average length of work of respondents was 10.87 (SD = 7.55) years with the shortest length of work being 1 year and the longest being 34 years. The average length of time as a TB manager was 3.77 years (SD 4.05) with the shortest being less than 1 year and the longest being 20 years. More than half, namely 66.3%, have a DIII Nursing education. More than three quarters of respondents, 75.9% were married. Almost all patients were PNS/P3K (94%). Most of the TB patients served are from poor families (68.7%); almost all have BPJS; almost all managers do not feel that there is cross-sectoral collaboration (94%).

From table 2 above, it can be seen that only the motivation variable has a significant relationship with TB treatment coverage (p value 0.035) with a low relationship in the positive direction. Other factor such as economic status, NIH status, and ntersectoral collaboration did not have signifivcant relationship with TC (p value > 0.05)

DISCUSSION

Tuberculosis or what is often called pulmonary TB is an infectious disease caused by Mycobacterium Tuberculosis. Pulmonary TB disease is transmitted through droplets contained in phlegm or saliva released when coughing, cleaning or talking, especially active sufferers who spread it more easily (Pondaa A, 2018). In several studies, it was found that it is possible that if one bacteriologically confirmed TB patient is not treated appropriately and with quality, it could infect around 10 people per year. Around 3.5 -10% of people who have contact with infectious TB patients will contract TB. Finding cases and treating them completely among the estimated TB cases is called treatment coverage.

This research tries to analyze the factors causing the low achievement of TB treatment coverage on the island of Timor, East Nusa Tenggara Province. From the research results, it was found that motivation factors had a significant relationship with TB treatment coverage (p value 0.035 < α: 0.05) with a low magnitude of relationship in a positive direction. This means that the better the motivation, the higher the TC TB coverage.

Motivation is a goal or encouragement that is the main driving force that comes from a person or from other people in an effort to get or achieve what they want, whether positive or negative (Dayana, 2018) Motivation is a driving force, with motivation humans will carry out activities more quickly, this is felt as a need. Motivation is the key to success. The higher the motivation, the better you will be at designing strategies to increase treatment coverage.

Table 1. Characteristic of study population (N=83)

Data Demographic	f	%	Mean	SD	Min-Max
Age			38.83	5.84	27-54
Length of working			10.87	7.55	1-34
Duration being TB Manager			3.77	4.05	0-20
Education					
Diploma (3 years)	53	66.3			
Diploma (4 years)	8	9.6			
Bachelor	20	24.1			
Marital Status					
Married	63	75.9			
Single	19	22.9			
Widow	1	1.2			
Employment Status					
Civil servant	78	94.0			
Honorary employee	5	6.0			
Economic Status					
Poor	57	68.7			
Not poor	26	31.3			
National Health Insurance Status					
No NIH	8	9.6			
Having NIH	75	90.4			
Intersectoral collaboration					
Yes	5	6			
No	78	94			
Motivation			92.49	14.47	56-113
Treatment Coverage			62.60	37.54	0-100

Table 2. The Relationship between independent variable and dependent variable

Variable	P value	R
Age	0.89	-0.01
Length of working	0.57	-0.06
Duration being TB Manager	0.44	0.08
Marital status	0.68	-0.04
Employment status	0.14	0.16
Education	0.35	-0.10
Economic status	0.43	-0.08
NIH status	0.57	-0.06
Intersectoral collaboration	0.11	-0.17
Motivation	0.035	0.23

One way TC achievements can be influenced by motivation. Motivation in increasing awareness and desire for treatment among sufferers greatly influences the success of TB treatment. Sometimes even though the symptoms of the disease are starting to get worse, if

the sufferer does not feel that sick, the sufferer tends not to seek treatment. Another factor is that the high level of treatment compliance can be caused by several supporting factors, such as medicines and services provided free of charge, health service centers that are easily accessible to the community and the desire from within to recover (Alwi et al., 2021).

Motivation emerged as the most significant factor influencing treatment coverage (TC) across the four public health centers studied on Timor Island. In-depth interviews and field observations revealed that the level of motivation among TB managers strongly determined their initiative, consistency, and creativity in implementing TB control programs. Motivated TB managers were more likely to actively trace missing cases, ensure patient adherence, and coordinate follow-up visits despite logistical and resource challenges.

In the four health centers, variations in motivation were influenced by differences in leadership support, workload, recognition, and perceived professional value. TB managers who received regular feedback, had supportive supervisors, and perceived their work as meaningful in reducing TB burden demonstrated higher motivation. Conversely, those who experienced limited recognition, unclear role distribution, and inadequate incentives expressed lower enthusiasm and often viewed TB management as an additional administrative task rather than a core public health responsibility.

Interestingly, other factors such as economic status, National Health Insurance (NHI) membership**,** and intersectoral collaboration did not show a statistically significant relationship with TC. Several possible explanations may underlie these findings:

Although poverty is known to influence health-seeking behavior, TB drugs in Indonesia are largely subsidized or provided free of charge, which may reduce the direct impact of individual economic differences on treatment. However, the transportation cost still need provided by people with TB. Moreover, community-based health workers often ensure that even low-income patients are enrolled and supported throughout their treatment.

Most TB patients are automatically covered by the National Health Insurance (BPJS)for diagnostic and treatment services. BPJS membership has no connection with TC because in Malaka, Belu, TTU and TTS districts, as long as the patient has an ID card, they can receive health services at the Puskesmas according to what the TB manager says.Therefore, NHI status may not serve as a differentiating variable. In practice, both insured and uninsured individuals receive similar TB care, limiting the variation needed to detect statistical significance.

While theoretically important, collaboration between sectors (e.g., health, education, local government, religious leader) may not have translated into concrete operational support at the facility level. The collaboration observed was often formal rather than functional—limited to meetings or documentation—without strong community-based follow-up or shared accountability for TB outcomes. Cross-sectoral collaboration is only carried out most often with village officials, although several community health centers can also involve the TNI/Babinsa in an effort to persuade the community to have their sputum checked by health workers.

Meanwhile, the factors age, length of work, length of time as a TB manager, economic status of TB sufferer's family, did not have a direct effect on the achievement of tuberculosis treatment coverage, and marital status (Deng et al., 2024). This may be because all TB managers, regardless of age or tenure, had received the same technical training and followed standardized national TB program guidelines issued by the Ministry of Health. Thus, adherence to protocol rather than individual age (Donald et al., 2010) or experience determined program performance. Moreover, institutional supervision and reporting mechanisms tend to minimize the variation that might arise from personal characteristics.

Similarly, the duration of assignment as a TB manager did not directly impact treatment coverage. The rotation of personnel within primary health care centers in Indonesia is relatively common (Sasmita, 2023) and newly assigned TB managers typically continue the existing program structure rather than redesign it. Therefore, the effectiveness of TB control efforts depends more on system continuity, teamwork, and organizational support than on the individual manager's tenure. Motivation and leadership engagement, rather than years in position, were more influential determinants of program success in this context.

The economic status of TB sufferers' families also did not show a direct relationship with treatment coverage. This finding aligns with Indonesia's universal TB care policy, where diagnostic and treatment services are provided free of charge under the National TB Program (Kemenkes, 2025). Consequently, economic constraints did not create major barriers to access or adherence. Furthermore, community-based health workers and TB cadres often play a key role in pro-

viding social and logistical support for patients from low-income backgrounds, thereby reducing the effect of socioeconomic disparities on treatment completion.

CONCLUSION

Factors related to treatment coverage in Timor island was the motivation of TB managers. Thus, TB managers need to be given adequate intensive care, especially when reaching remote areas and where transportation is difficult to access. This is important to pay attention in order to equalize access to TB case detection and increase TC.

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REFERENCES

Dinas Kesehatan Propinsi NTT. Treatment Coverage Provinsi NTT Tahun 2023. (2024). Unpublished report.

Deristo Lega A, Megatsari H, Devy SR. Ecological Analysis of Success of TB Treatment and Its Related Factors in Indonesia in 2019 (2021)Vol. 21. Available from: www.pusdatin.kemkes.go.id,

European Centre for Disease Prevention and Control. (2014). Healthcare system factors influencing treatment results of MDR TB patients Treatment outcomes. Available from: https://www.ecdc.europa.eu/sites/default/files/media/en/publications/Publications/mdr-tb-healthcare-factors-influencing-treatment-results.pdf

Gilmour B, Xu Z, Bai L, Alene KA, Clements ACA. (2022). Risk factors associated with unsuccessful tuberculosis treatment outcomes in Hunan Province, China. Tropical Medicine and International Health, 1;27(3):290–9.

Melese A, Zeleke B. (2018). Factors associated with poor treatment outcome of tuberculosis in Debre Tabor, northwest Ethiopia. BMC Res Notes, 15;11(1).

Nguyen Binh H, Pham Huyen K, Hennig C, Chu Thi H, Le Xuan C, Le Thuong V, et al. (2012). A descriptive study of TB cases finding practices in the three largest public general hospitals in Vietnam. BMC Public Health,12(1).

BPS. Persentase Penduduk Miskin Menurut Kabupaten/Kota (Persen), 2021-2023. 2024.

Torres NMC, Rodríguez JJQ, Andrade PSP, Arriaga MB, Netto EM. (2019). Factors predictive of the success of tuberculosis treatment: A systematic review with meta-analysis. PLoS One, 1;14(12).

Alwi, N. P., Fitri, A., & Ambarita, R. (2021). Hubungan Motivasi dan Kepatuhan Minum obat Anti Tuberkulosis (OAT) Pada Pasien Tuberkulosis. *Jurnal Keperawatan Abdurrab*, *05*(01).

Dayana, I. & M. J. (2018). *Motivasi Kehidupan*. Guepedia Publisher.

Deng, L. Le, Zhao, F., Li, Z. W., Zhang, W. W., He, G. X., & Ren, X. (2024). Epidemiological characteristics of tuberculosis incidence and its macro-influence factors in Chinese mainland during 2014–2021. *Infectious Diseases of Poverty*, *13*(1). https://doi.org/10.1186/s40249-024-01203-6

Donald, P. R., Marais, B. J., & Barry, C. E. (2010). *Comment Age and the epidemiology and pathogenesis of tuberculosis*. https://doi.org/10.1016/S0140

Kemenkes. (2025). *Layanan TB itu Gratis, Pemerintah Tegaskan Lindungi SM Indonesia*. https://kemkes.go.id/id/layanan-tbc-itu-gratis-pemerintah-tegaskan-komitmen-lindungi-sdm-indonesia

Kemenkes RI. (2023) Laporan Program Penanggulangan Tuberkulosis Tahun 2022 Kementerian Kesehatan Republik Indonesia Tahun 2023 (Report on the 2022 Tuberculosis Control Program of the Ministry of Health of the Republic of Indonesia). Jakarta.

Pondaa A, M. A. B. V. (2018). *Hubungan Motivasi dan Sikap Pasien dengan Tindakan Pencegahan Penyakit Tuberkulosis Paru di Puskesmas Kauditan Kabupaten Minahasa Utara*.

Sasmita, E. Y. F. R. T. T. R. (2023). Pengaruh Rotasi Kerja Terhadap Kompetensi Perawat di Kamar Efektif Instalasi Bedah Sentral RSUD Dr. Saiful Anwar Malang. *Profesional Health Journal* (Vol. 4, Issue 2). https://www.ojsstikesbanyuwangi.com/index.php/PHJ

World Health Organization. Global tuberculosis report 2023 [Internet]. (2023). Available from: https://iris.who.int/.